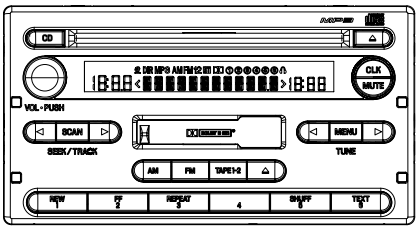
Pioneer *sound.vision.soul*

# Service Manual

**FORD**



FH-2037ZF/X1R/UC

**ORDER NO.**
**CRT3095**

**COMPACT DISC CASSETTE RADIO**

# FH-2037ZF X1R/UC

| VEHICLE | DESTINATION | PRODUCED AFTER | FORD PART No. | ID No. | PIONEER MODEL No. |
|---|---|---|---|---|---|
| Ranger | U.S.A., CANADA | August 2003 | FS-4L5T-18C868-AF | —— | FH-2037ZF/X1R/UC |

● **This service manual should be used together with the following manual(s):**

| Model No. | Order No. | Mech. Module | Remarks |
|---|---|---|---|
| CX-3007 | CRT2820 | S9MP3 | CD Mech. Module:Circuit Description, Mech.Description, Disassembly |
| CX-1011 | CRT2406 | 3L | Cassette Mech. Module:Mech.Description, Disassembly |

● **Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation."Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.**

For details, refer to "Important symbols for good services".

**PIONEER CORPORATION** 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153-8654, Japan
**PIONEER ELECTRONICS (USA) INC.** P.O.Box 1760, Long Beach, CA 90801-1760 U.S.A.
**PIONEER EUROPE NV** Haven 1087 Keetberglaan 1, 9120 Melsele, Belgium
**PIONEER ELECTRONICS ASIACENTRE PTE.LTD.** 253 Alexandra Road, #04-01, Singapore 159936

© **PIONEER CORPORATION 2003**

**K-ZZD. JUNE 2003 Printed in Japan**

**[ Important symbols for good services ]**
In this manual, the symbols shown-below indicate that adjustments, settings or cleaning should be made securely.
When you find the procedures bearing any of the symbols, be sure to fulfill them:

1. Product safety

You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.

2. Adjustments

To keep the original performances of the product, optimum adjustments or specification confirmation is indispensable. In accordance with the procedures or instructions described in this manual, adjustments should be performed.

3. Cleaning

For optical pickups, tape-deck heads, lenses and mirrors used in projection monitors, and other parts requiring cleaning, proper cleaning should be performed to restore their performances.

4. Shipping mode and shipping screws

To protect the product from damages or failures that may be caused during transit, the shipping mode should be set or the shipping screws should be installed before shipping out in accordance with this manual, if necessary.

5. Lubricants, glues, and replacement parts

Appropriately applying grease or glue can maintain the product performances. But improper lubrication or applying glue may lead to failures or troubles in the product. By following the instructions in this manual, be sure to apply the prescribed grease or glue to proper portions by the appropriate amount.For replacement parts or tools, the prescribed ones should be used.

**● CD section precaution**

1. Before disassembling the unit, be sure to turn off the power. Unplugging and plugging the connectors during power-on mode may damage the ICs inside the unit.
2. To protect the pickup unit from electrostatic discharge during servicing, take an appropriate treatment (shorting-solder) by referring to “the DISASSEMBLY” on page 58.
3. After replacing the pickup unit, be sure to check the grating. (See p.52.)

# SAFETY INFORMATION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

# CONTENTS


SAFETY INFORMATION ..... 2
1. SPECIFICATIONS ..... 4
2. EXPLODED VIEWS AND PARTS LIST ..... 6
2.1 EXTERIOR ..... 6
2.2 CD MECHANISM MODULE ..... 8
2.3 CASSETTE MECHANISM MODULE ..... 10
3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM ..... 12
3.1 BLOCK DIAGRAM ..... 12
3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE) ..... 14
3.3 KEYBOARD UNIT ..... 20
3.4 CD MECHANISM MODULE(GUIDE PAGE) ..... 22
3.5 CASSETTE MECHANISM MODULE ..... 30
4. PCB CONNECTION DIAGRAM ..... 32
4.1 MOTHER UNIT ..... 32
4.2 KEYBOARD UNIT ..... 36
4.3 CD MECHANISM MODULE ..... 38
4.4 CASSETTE MECHANISM MODULE ..... 40
5. ELECTRICAL PARTS LIST ..... 42
6. ADJUSTMENT ..... 49
6.1 DOLBY B NR ADJUSTMENT ..... 49
6.2 CD ADJUSTMENT ..... 50
6.3 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT ..... 52
6.4 CD TEST MODE ..... 54
7. GENERAL INFORMATION ..... 58
7.1 DIAGNOSIS ..... 58
7.1.1 DISASSEMBLY ..... 58
7.1.2 CONNECTOR FUNCTION DESCRIPTION ..... 63
7.2 PARTS ..... 64
7.2.1 IC ..... 64
7.2.2 DISPLAY ..... 72
7.3 OPERATIONAL FLOW CHART ..... 73
7.4 CLEANING ..... 74
8. OPERATIONS ..... 75


COMPACT disc DIGITAL AUDIO

# 1. SPECIFICATIONS

## General

| | |
|---|---|
| Power source | 14.4V DC(10.5V-16.0V allowable) |
| Grounding system | Negative type |
| Backup current | 3mA or less |
| Dimensions | 188(W) x100(H) x187(D)mm |
| Weight | 2.3kg |

## CD player

| | |
|---|---|
| System | Compact disc audio system |
| Usable discs | Compact disc |
| Signal format | Sampling frequency : 44.1kHz<br>Number of quantization bits : 16;linear |
| S/N | 70dB or more |
| Distortion | 0.1% or less |
| MP3 decoding format | MPEG1 and MPEG2 audio layer 3 |

## Cassette player

| | |
|---|---|
| Tape | Compact cassette tape(C30-C90) |
| Tape speed | 4.76cm/sec.(+0.14cm/sec.,-0.05cm/sec.) |
| Wow and flutter | 0.3% or less |

## FM tuner

| | |
|---|---|
| Frequency | 87.75, 87.9-107.9 MHz |
| S/N | 58dB or more |
| Distortion | 1.0% or less |
| IF interference | 95dB or more |
| Image interference | 45dB or more |
| Stereo Separation | 25dB or more(400Hz) |

## AM tuner

| | |
|---|---|
| Frequency | 530-1710 kHz |
| S/N 20dB useable sensibility | 33dBμ +4dB, -5dB |
| S/N | 50dB +10dB, -6dB |
| Distortion | 1.5% or less |
| IF interference | 75dB or more |
| Image interference | 60dB or more |

A

B

C

D

E

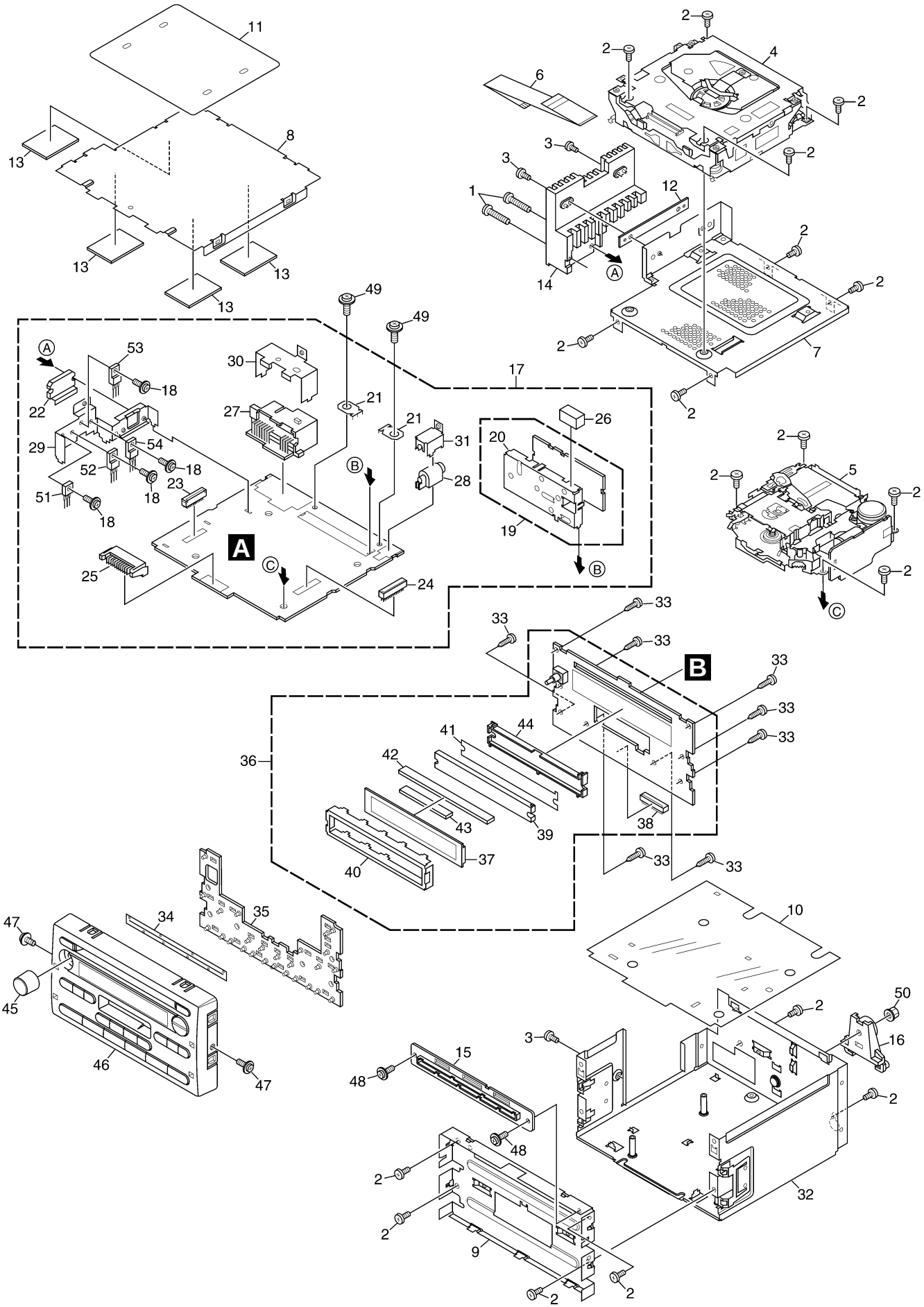
F



5 6 7 8

# 2. EXPLODED VIEWS AND PARTS LIST

## 2.1 EXTERIOR



**NOTE:**

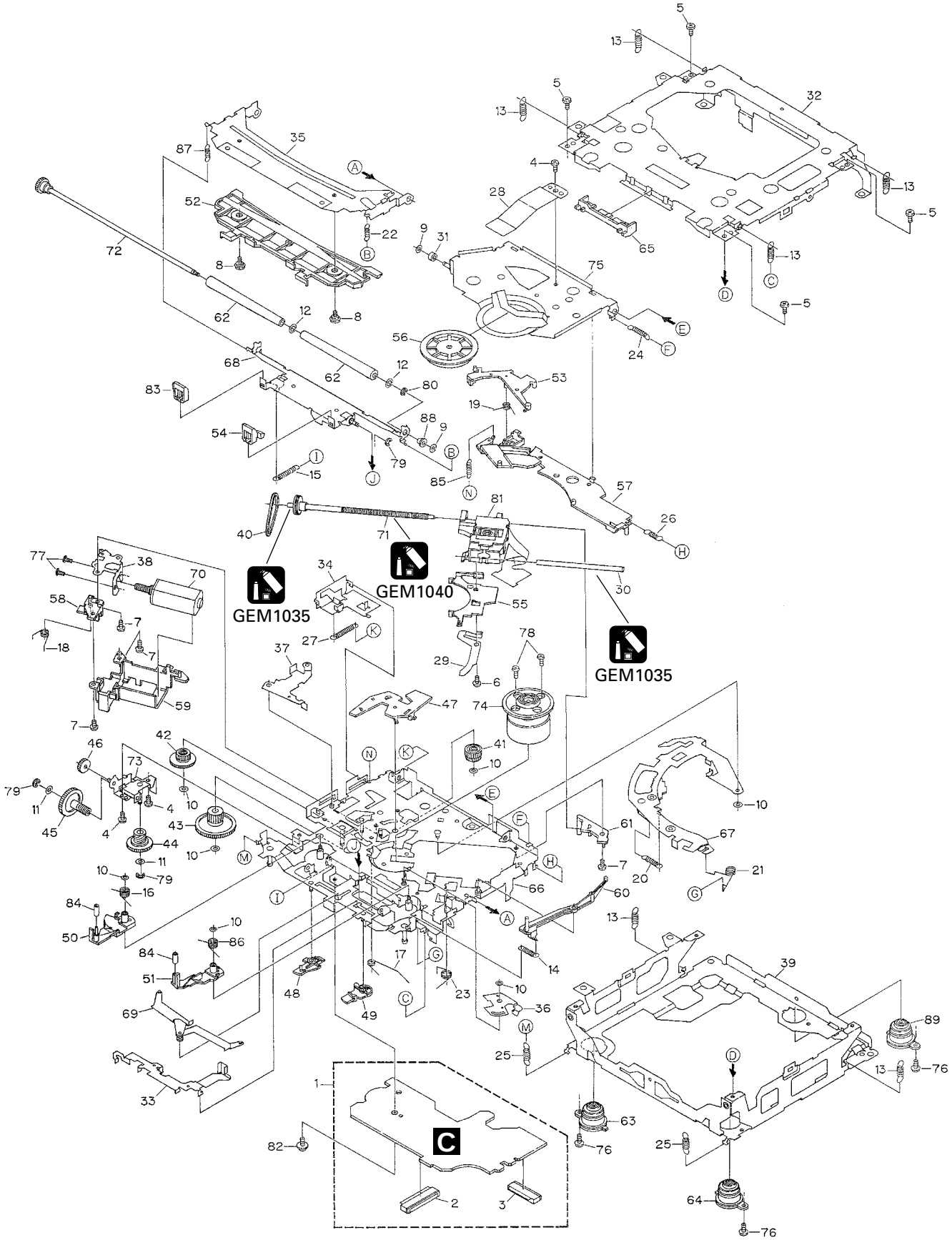
- Parts marked by "*" are generally unavailable because they are not in our Master Spare Parts List.
- Screws adjacent to ∇ mark on the product are used for disassembly.
- For the applying amount of lubricants or glue, follow the instructions in this manual.
  ( In the case of no amount instructions, apply as you think it appropriate.)

## ● EXTERIOR SECTION PARTS LIST

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 1 | Screw | BMZ26P200FMC |
| | 2 | Screw | BSZ26P060FMC |
| | 3 | Screw | BSZ26P080FZK |
| | 4 | CD Mechanism Module(S9MP3) | CXK5536 |
| | 5 | Cassette Mechanism Module | EXK4260 |
| | 6 | Connector | HDE0042 |
| | 7 | Chassis | HNA0012 |
| | 8 | Case | HNB0166 |
| | 9 | Holder | HNC0121 |
| | 10 | Insulator | HNM0092 |
| | 11 | Seal | HNM0115 |
| | 12 | Insulator | HNM0116 |
| * | 13 | Insulator | HNM5230 |
| | 14 | Heat Sink | HNR0242 |
| | 15 | Holder | HNV0048 |
| | 16 | Rail Guide | HNV6756 |
| | 17 | Mother Unit | HWM0084 |
| | 18 | Screw | ASZ26P080FMC |
| | 19 | FM/AM Tuner Unit | CWE1561 |
| | 20 | Holder | CNC8855 |
| | 21 | Terminal(CN401,402) | CKF1059 |
| | 22 | IC(IC201) | TDA7384 |
| * | 23 | Connector(CN608) | CKS2251 |
| | 24 | Connector(CN606) | CKS3568 |
| | 25 | Connector(CN604) | CKS4575 |
| | 26 | Cushion | CNM6825 |
| | 27 | Plug(CN601) | HKM1372 |
| | 28 | Antenna Jack(CN602) | HKX1054 |
| | 29 | Holder | HNC0119 |
| | 30 | Holder | HNC0120 |
| | 31 | Holder | HNC0125 |
| | 32 | Chassis Unit | HXA0378 |
| | 33 | Screw | BPZ26P080FMC |
| | 34 | Cover | HNM7654 |
| | 35 | Rubber | HNV7062 |
| | 36 | Keyboard Unit | HWM0085 |
| | 37 | LCD(LCD904) | CAW1822 |
| | 38 | Connector(CN901) | CKS4576 |
| | 39 | Lighting Conductor | CNV7936 |
| | 40 | Holder | HNC9816 |

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 41 | Sheet | HNM0103 |
| | 42 | Connector | HNV0049 |
| | 43 | Connector | HNV0050 |
| | 44 | Housing | HNV7069 |
| | 45 | Knob Assy | HXA0385 |
| | 46 | Grille Unit | HXA0419 |
| | 47 | Screw | IMS20P040FZK |
| | 48 | Screw | IMS26P040FMC |
| | 49 | Screw | ISS26P055FUC |
| | 50 | Nut | NF50FMC |
| | 51 | Transistor(Q824) | KSA1220 |
| | 52 | Transistor(Q700) | KSD1273 |
| | 53 | Transistor(Q821) | 2SB942A |
| | 54 | Transistor(Q805) | KSB1366 |

## 2.2 CD MECHANISM MODULE

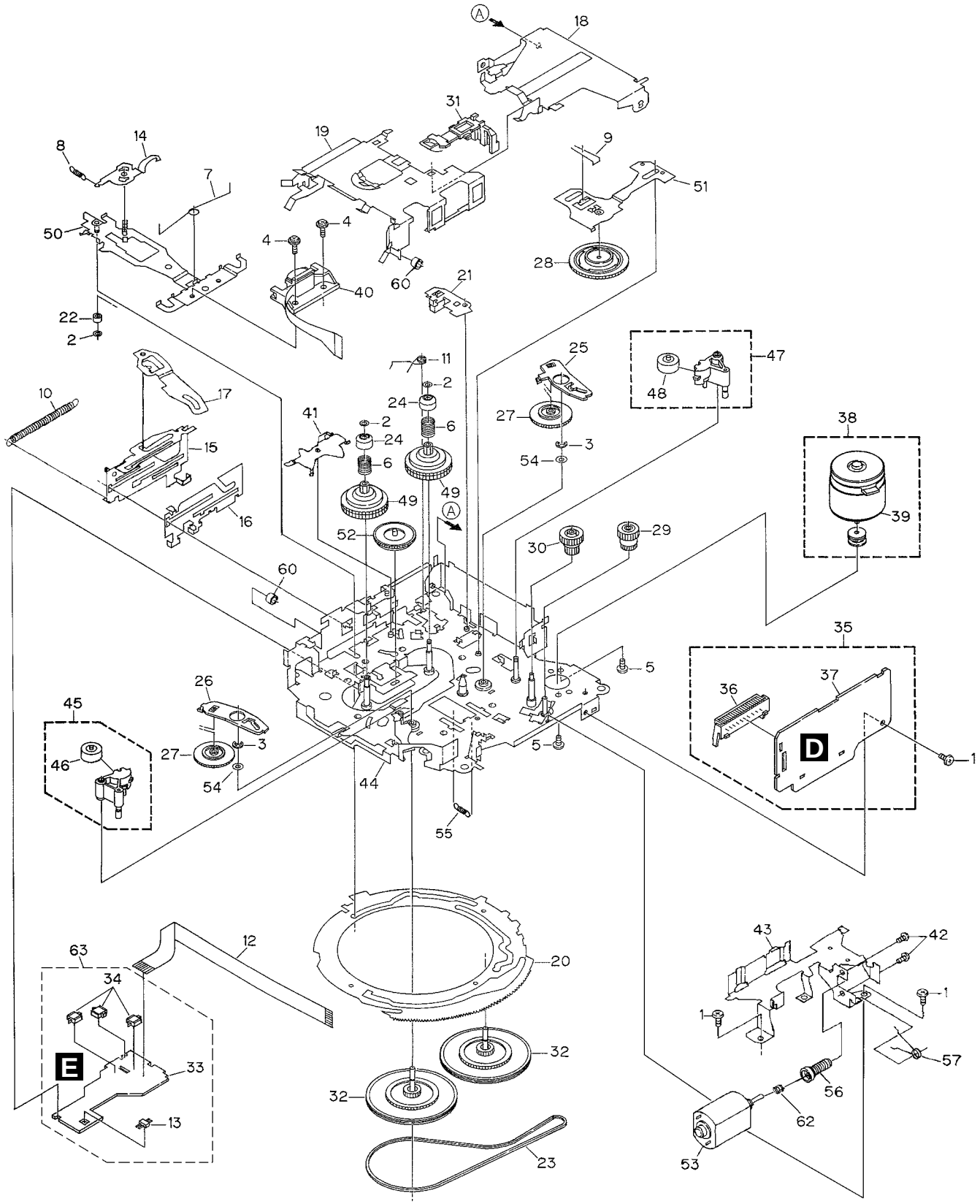


## ● CD MECHANISM MODULE SECTION PARTS LIST

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 1 | CD Core Unit(S9MP3) | CWX2687 |
| | 2 | Connector(CN901) | CKS4188 |
| | 3 | Connector(CN101) | CKS3486 |
| | 4 | Screw | BMZ20P025FTC |
| | 5 | Screw | BSZ20P040FTC |
| | 6 | Screw(M2x4) | CBA1362 |
| | 7 | Screw(M2x3) | CBA1527 |
| | 8 | Screw | CBA1545 |
| | 9 | Washer | CBF1037 |
| | 10 | Washer | CBF1038 |
| | 11 | Washer | CBF1039 |
| | 12 | Washer | CBF1060 |
| | 13 | Spring | CBH2378 |
| | 14 | Spring | CBH2379 |
| | 15 | Spring | CBH2514 |
| | 16 | Spring | CBH2533 |
| | 17 | Spring | CBH2382 |
| | 18 | Spring | CBH2383 |
| | 19 | Spring | CBH2384 |
| | 20 | Spring | CBH2527 |
| | 21 | Spring | CBH2386 |
| | 22 | Spring | CBH2537 |
| | 23 | Spring | CBH2390 |
| | 24 | Spring | CBH2391 |
| | 25 | Spring | CBH2523 |
| | 26 | Spring | CBH2426 |
| | 27 | Spring | CBH2444 |
| | 28 | Spring | CBL1561 |
| | 29 | Spring | CBL1553 |
| | 30 | Shaft | CLA3845 |
| | 31 | Roller | CLA3910 |
| | 32 | Frame | CNC9654 |
| | 33 | Lever | CNC9664 |
| | 34 | Lever | CNC8949 |
| | 35 | Arm | CNC9661 |
| | 36 | Arm | CNC9016 |
| | 37 | Arm | CNC9017 |
| | 38 | Bracket | CNC9123 |
| | 39 | Frame | CNC8947 |
| | 40 | Belt | CNT1086 |
| | 41 | Gear | CNV6886 |
| | 42 | Gear | CNV6316 |
| | 43 | Gear | CNV6317 |
| | 44 | Gear | CNV6318 |
| | 45 | Gear | CNV6319 |
| | 46 | Gear | CNV6320 |
| | 47 | Arm | CNV6322 |
| | 48 | Arm | CNV6323 |
| | 49 | Arm | CNV6324 |
| | 50 | Arm | CNV6888 |
| | 51 | Arm | CNV6889 |
| | 52 | Guide | CNV6327 |
| | 53 | Arm | CNV6924 |
| | 54 | Guide | CNV6921 |
| | 55 | Rack | CNV6923 |
| | 56 | Clamper | CNV6331 |
| | 57 | Arm | CNV6332 |
| | 58 | Guide | CNV6333 |
| | 59 | Cover | CNV6334 |
| | 60 | Arm | CNV6335 |
| | 61 | Guide | CNV6336 |
| | 62 | Roller | CNV6338 |
| | 63 | Damper | CNV6175 |
| | 64 | Damper | CNV6662 |
| | 65 | Guide | CNV6925 |
| | 66 | Chassis Unit | CXB7980 |
| * | 67 | Arm Unit | CXB7983 |
| | 68 | Arm Unit | CXB7984 |
| | 69 | Arm Unit | CXB7985 |
| | 70 | Motor Unit(M2) | CXB5903 |
| | 71 | Screw Unit | CXB5904 |
| | 72 | Gear Unit | CXB8076 |
| | 73 | Bracket Unit | CXB7982 |
| | 74 | Motor Unit(M1) | CXB6007 |
| | 75 | Arm Unit | CXB8504 |
| | 76 | Screw(M2x5) | EBA1028 |
| | 77 | Screw | JFZ20P020FTC |
| | 78 | Screw | JGZ17P020FZK |
| | 79 | Washer | YE15FTC |
| | 80 | Washer | YE20FTC |
| | 81 | Pickup Unit(Service)(P9MP3) | CXX1551 |
| | 82 | Screw | IMS26P030FTC |
| | 83 | Guide | CNV6922 |
| | 84 | Roller | CNV6887 |
| | 85 | Spring | CBH2509 |
| | 86 | Spring | CBH2512 |
| | 87 | Spring | CBH2536 |
| | 88 | Collar | CNV6906 |
| | 89 | Damper | CNV6863 |

## 2.3 CASSETTE MECHANISM MODULE

For grease application, refer to the service manual for CX-1011 (CRT2406).

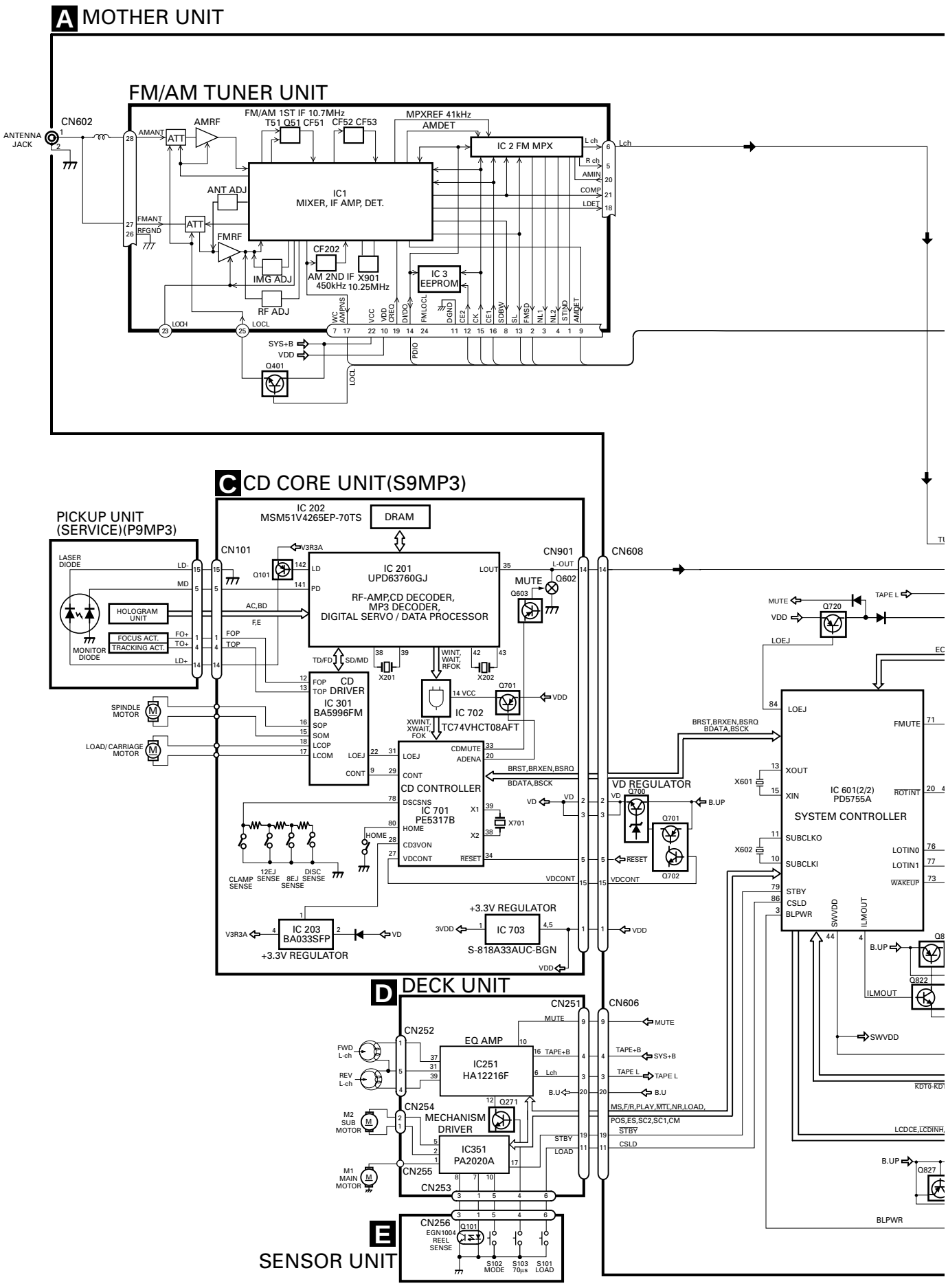


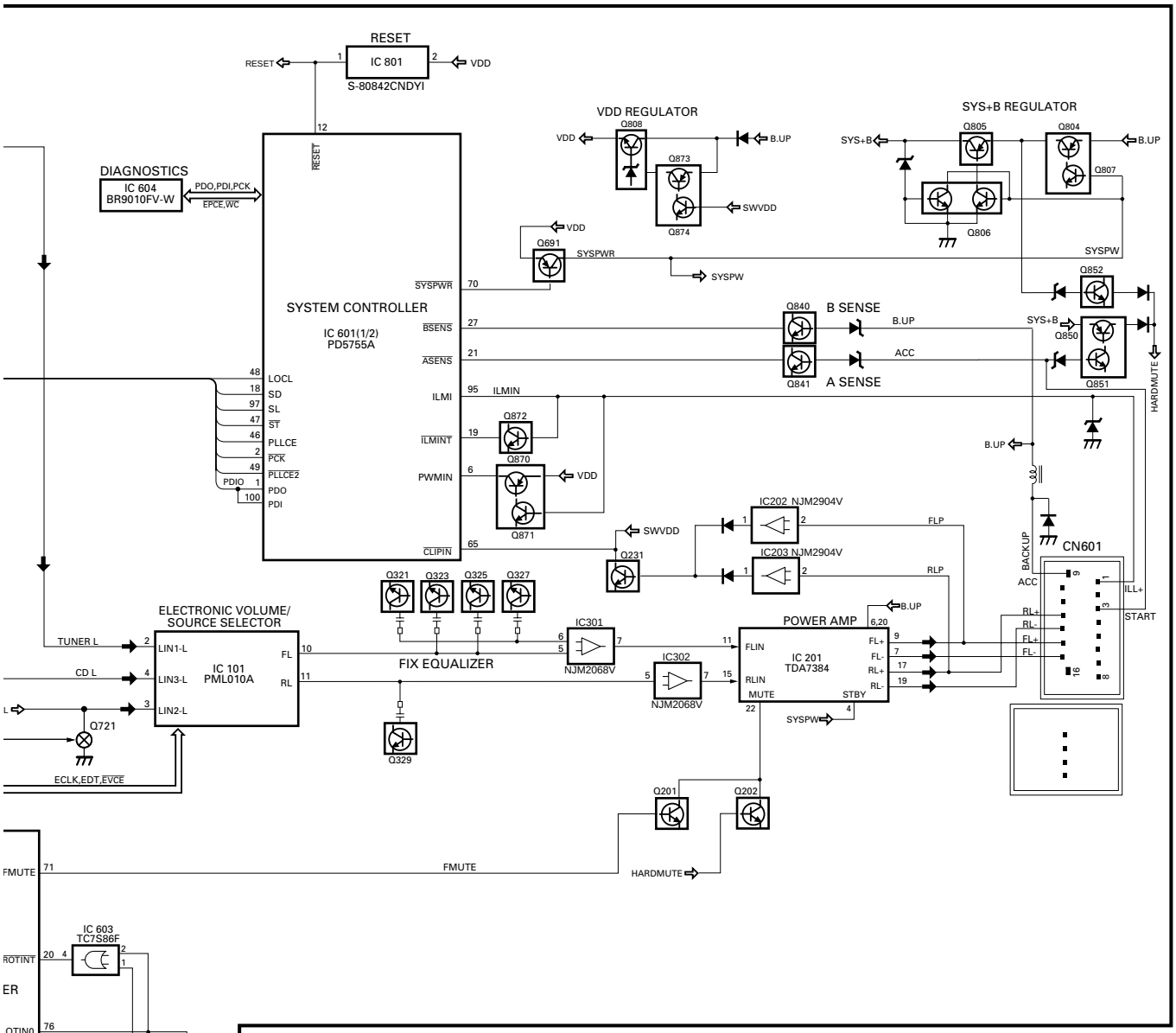
## ● CASSETTE MECHANISM MODULE SECTION PARTS LIST

| Mark | No. | Description | Part No. |
|---|---|---|---|
| | 1 | Screw | BSZ20P040FMC |
| | 2 | Washer | CBF1037 |
| | 3 | Washer | CBG1003 |
| | 4 | Screw | EBA1028 |
| | 5 | Screw | CBA1037 |
| | 6 | Spring | EBH1653 |
| | 7 | Spring | EBH1642 |
| | 8 | Spring | EBH1641 |
| | 9 | Spring | EBH1626 |
| | 10 | Spring | EBH1627 |
| | 11 | Spring | EBH1648 |
| | 12 | Cord | EDD1024 |
| | 13 | Photo-reflector(Q101) | EGN1004 |
| | 14 | Arm | ENC1526 |
| * | 15 | Lever | ENC1544 |
| | 16 | Lever | ENC1543 |
| | 17 | Arm | ENC1532 |
| | 18 | Frame | ENC1533 |
| | 19 | Holder | ENC1547 |
| | 20 | Gear | ENC1535 |
| | 21 | Arm | ENC1550 |
| | 22 | Roller | ENR1040 |
| | 23 | Belt | ENT1027 |
| | 24 | Collar | ENV1508 |
| | 25 | Arm | ENV1539 |
| | 26 | Arm | ENV1540 |
| | 27 | Gear | ENV1569 |
| | 28 | Gear | ENV1547 |
| | 29 | Gear | ENR1044 |
| | 30 | Worm Wheel | ENV1559 |
| | 31 | Lever | ENV1551 |
| | 32 | Flywheel | ENV1554 |
| | 33 | PCB | ENP1196 |
| | 34 | Switch(S101,S102,S103) | ESG1007 |
| | 35 | Deck Unit | EWM1031 |
| | 36 | Plug(CN251) | CKS3540 |
| | 37 | Gathering PCB | ENX1066 |
| | 38 | Motor Unit(M1) | EXA1491 |
| | 39 | Motor | EXM1028 |
| | 40 | Head Assy(HD1) | EXA1594 |
| | 41 | Arm | ENC1537 |
| | 42 | Screw | JGZ20P025FNI |
| | 43 | Guide | ENC1545 |
| | 44 | Chassis Unit | EXA1609 |
| | 45 | Pinch Holder Unit | EXA1608 |
| | 46 | Pinch Roller | ENV1518 |
| | 47 | Pinch Holder Unit | EXA1607 |
| | 48 | Pinch Roller | ENV1518 |
| | 49 | Reel Unit | EXA1625 |
| | 50 | Head Base Unit | EXA1611 |
| | 51 | Lever Unit | EXA1587 |
| | 52 | Gear Unit | EXA1596 |
| | 53 | Motor Unit(M2) | EXA1623 |
| | 54 | Washer | HBF-179 |
| | 55 | Spring | EBH1537 |
| | 56 | Worm Gear | ENV1564 |
| | 57 | Spring | EBH1654 |
| | 58 | ••••• | |
| | 59 | ••••• | |
| | 60 | Tube | ENM1039 |
| | 61 | ••••• | |
| | 62 | Spring | EBH1545 |
| | 63 | Sensor Unit | EWM1036 |

# 3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

## 3.1 BLOCK DIAGRAM

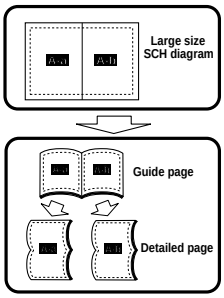


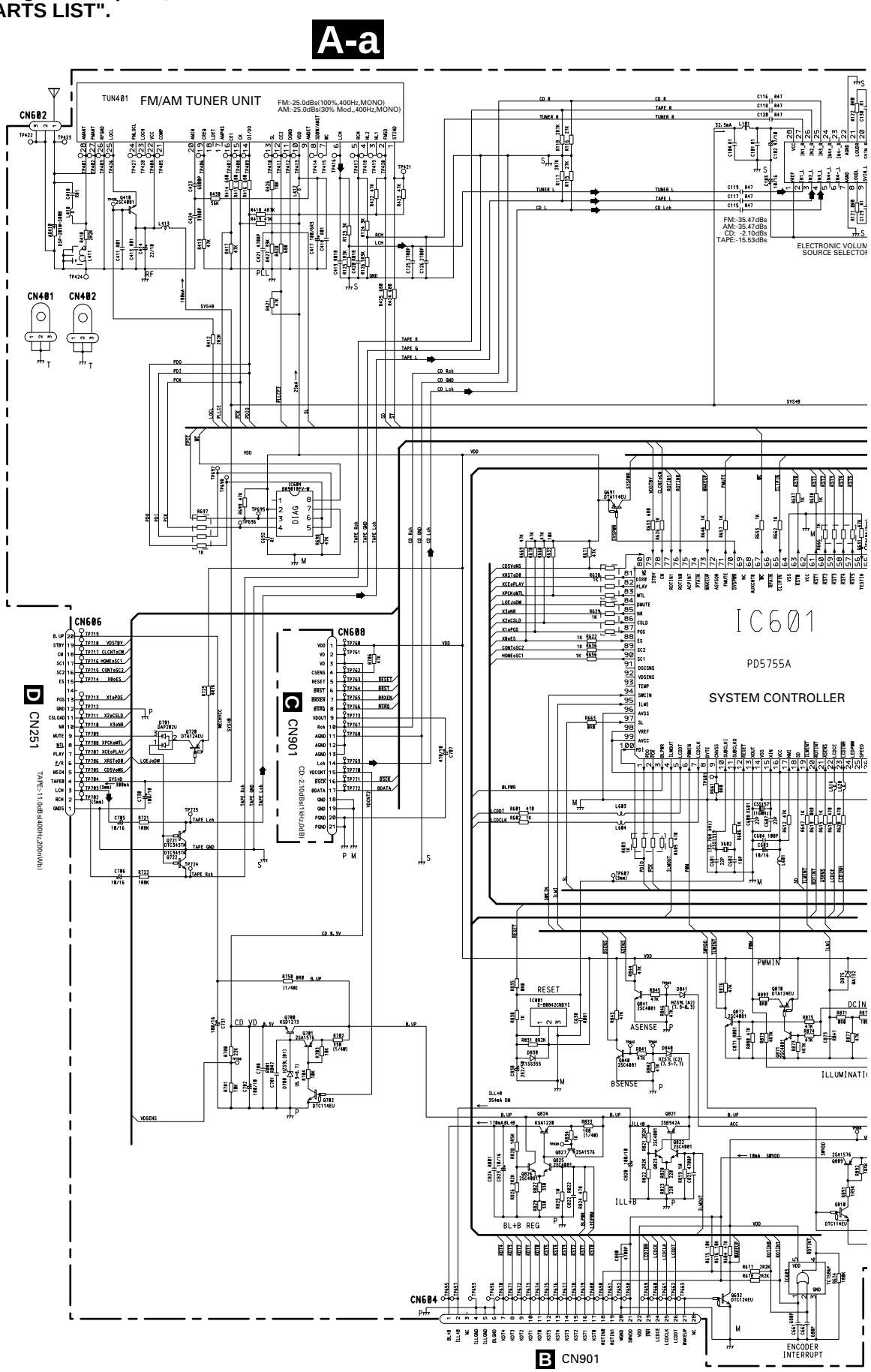



## B KEYBOARD UNIT

# 3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

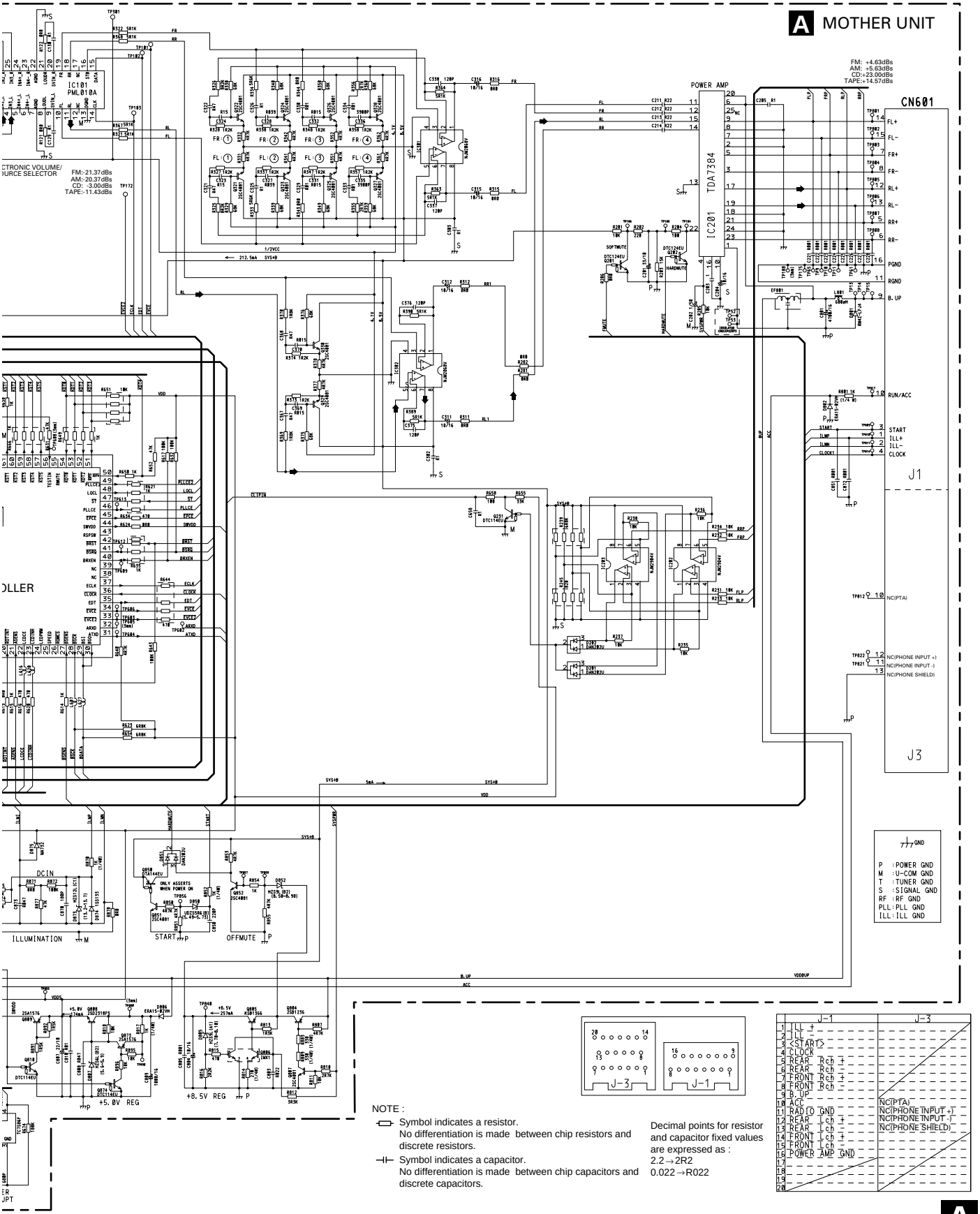
**Note: When ordering service parts, be sure to refer to " EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".**



# A-b

## A MOTHER UNIT




NOTE :

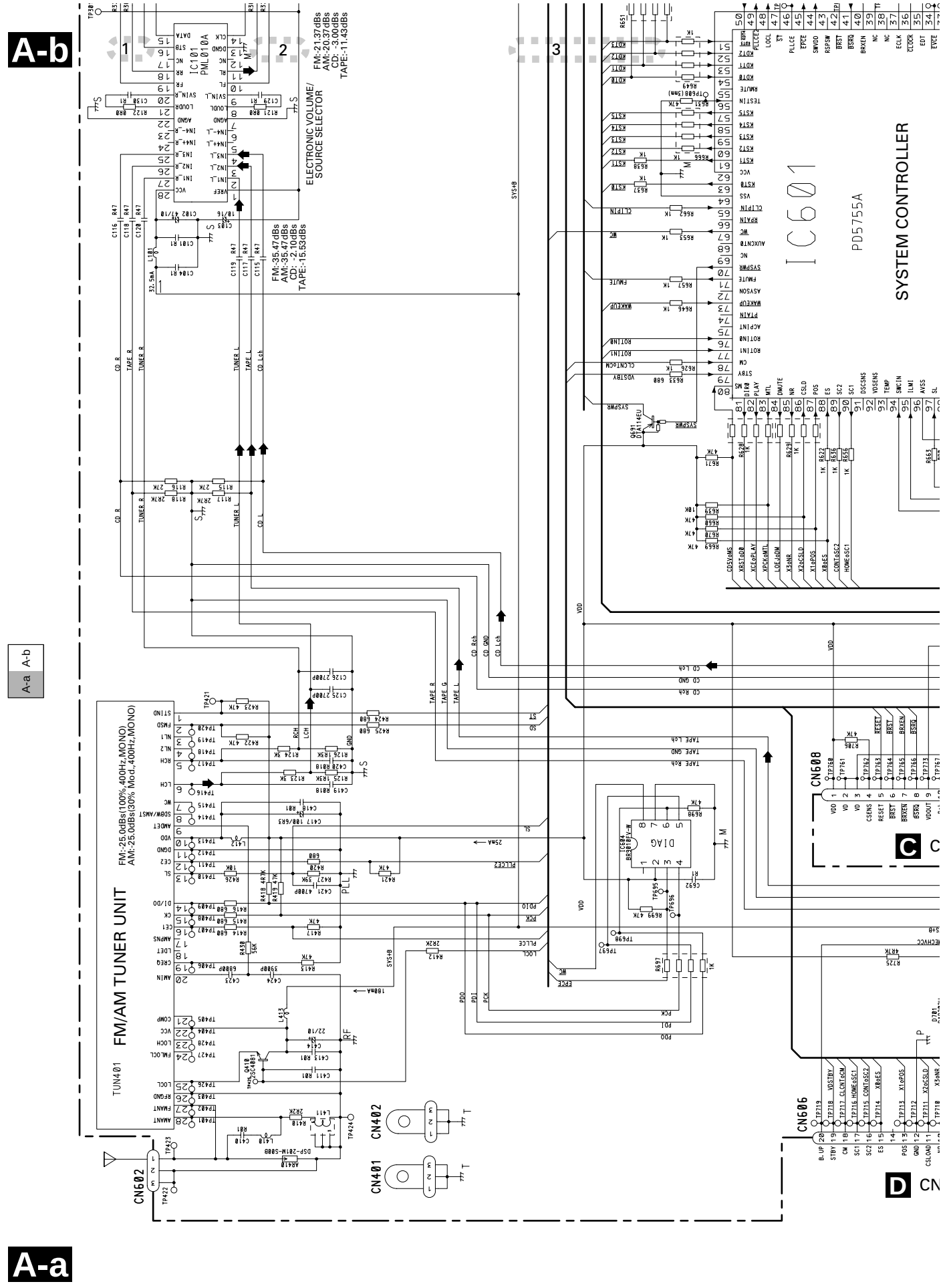
- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

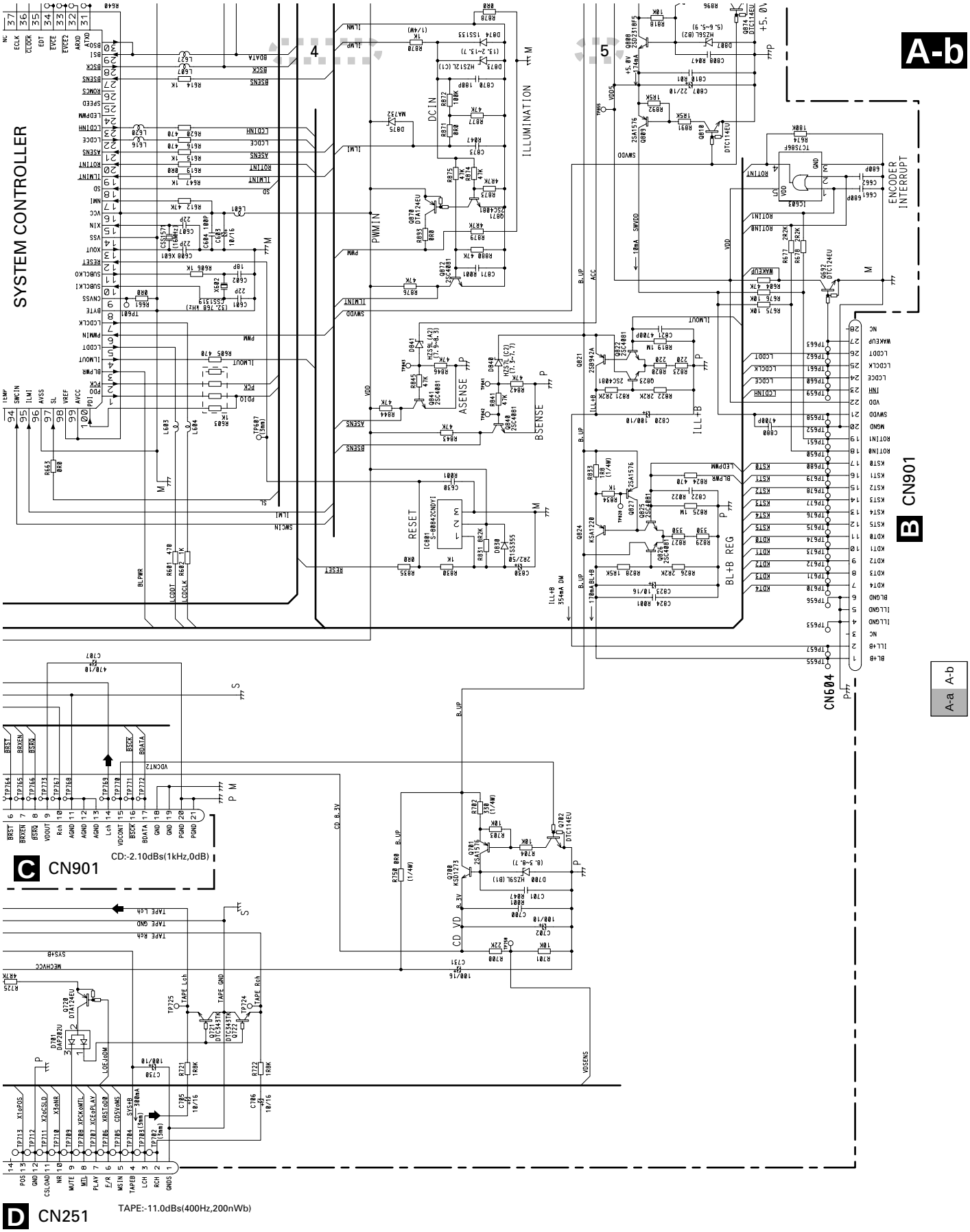
Decimal points for resistor and capacitor fixed values are expressed as :
2.2→2R2
0.022→R022

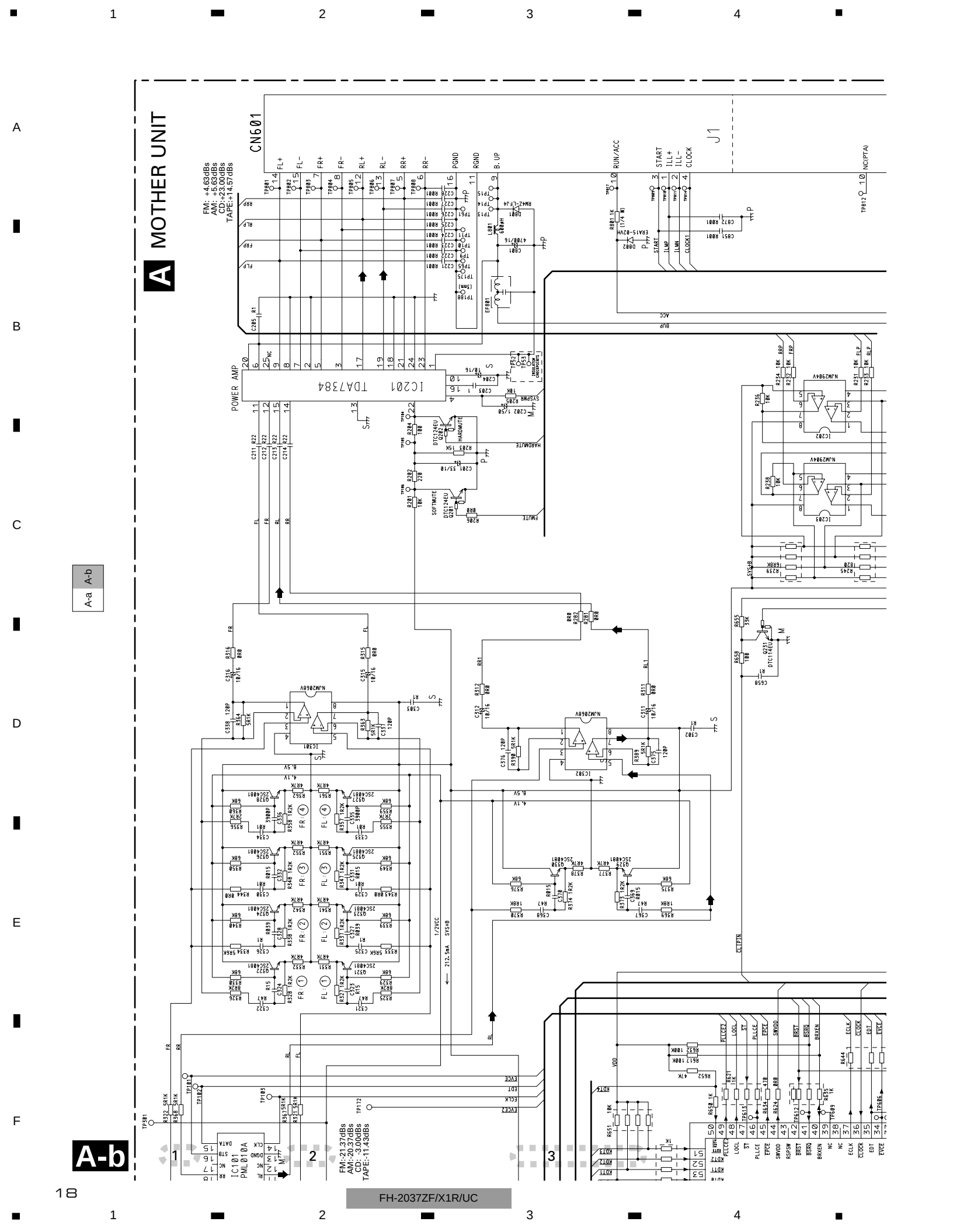


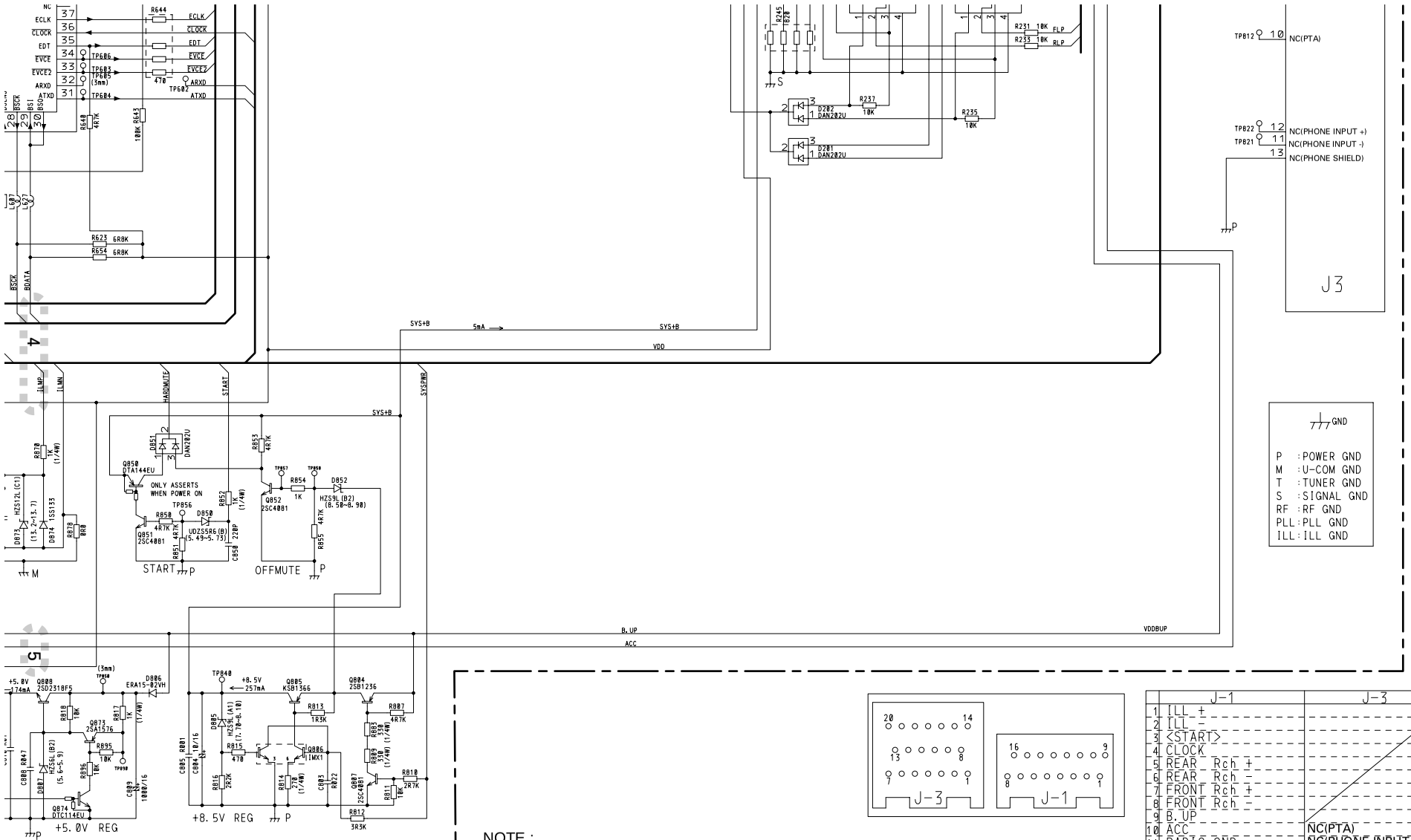

| J-1 | J-3 |
|---|---|
| 1 ILL + | |
| 2 ILL - | |
| 3 START | |
| 4 CLOCK | |
| 5 REAR Rch + | |
| 6 REAR Rch - | |
| 7 FRONT Rch + | |
| 8 FRONT Rch - | |
| 9 B. UP | |
| 10 ACC | NC(PTA) |
| 11 RADIO GND | NC(PHONE INPUT +) |
| 12 REAR Lch + | NC(PHONE INPUT -) |
| 13 REAR Lch - | NC(PHONE SHIELD) |
| 14 FRONT Lch + | |
| 15 FRONT Lch - | |
| 16 POWER AMP GND | |
| 17 | |
| 18 | |
| 19 | |
| 20 | |

A


A-b
A-a
SYSTEM CONTROLLER
IC601
PD5755A
ELECTRONIC VOLUME/
SOURCE SELECTOR
FM/AM TUNER UNIT
TUN401
IC101
PML0100A
CN602
CN401
CN402
CN608
CN606
DIAG
FM:-21.37dBs
AM:-20.37dBs
CD: -3.00dBs
TAPE:-11.43dBs
FM:-35.47dBs
AM:-35.47dBs
CD: -2.10dBs
TAPE:-15.53dBs
FM:-25.0dBs(100%,400Hz,MONO)
AM:-25.0dBs(30% Mod.,400Hz,MONO)


A-b
A-a
SYSTEM CONTROLLER
ILLUMINATION
DCIN
PWMIN
ASENSE
BSENSE
RESET
ILL+B
BL+B REG
ENCODER INTERRUPT
B CN901
CN604
C CN901
CD:-2.10dBs(1kHz,0dB)
D CN251
TAPE:-11.0dBs(400Hz,200nWb)


A MOTHER UNIT
CN601
FL+
FL-
FR+
FR-
RL+
RL-
RR+
RR-
PGND
RGND
B.UP
RUN/ACC
START
ILL+
ILL-
CLOCK
NC(PTA)
FM: +4.63dBs
AM: +5.63dBs
CD: +23.00dBs
TAPE:+14.57dBs
POWER AMP
IC201 TDA7384
HARDMUTE
SOFTMUTE
MUTE
SYSPWR
NJM2904V
NJM2068V
IC301
IC302
IC303
IC101
PML0100A
FM:-21.37dBs
AM:-20.37dBs
CD: -3.00dBs
TAPE:-11.43dBs
A-b
A-a
1/2VCC
SYS+B
ACC
BUP
CLTPTN
FVCC
EDT
ECLK
PLLCE2
LOCL
ST
PLLCE
EPCE
SWVDD
RSPSW
BRST
BSRQ
BRXEN
ECLK
CCOCK
EDT
EVCE



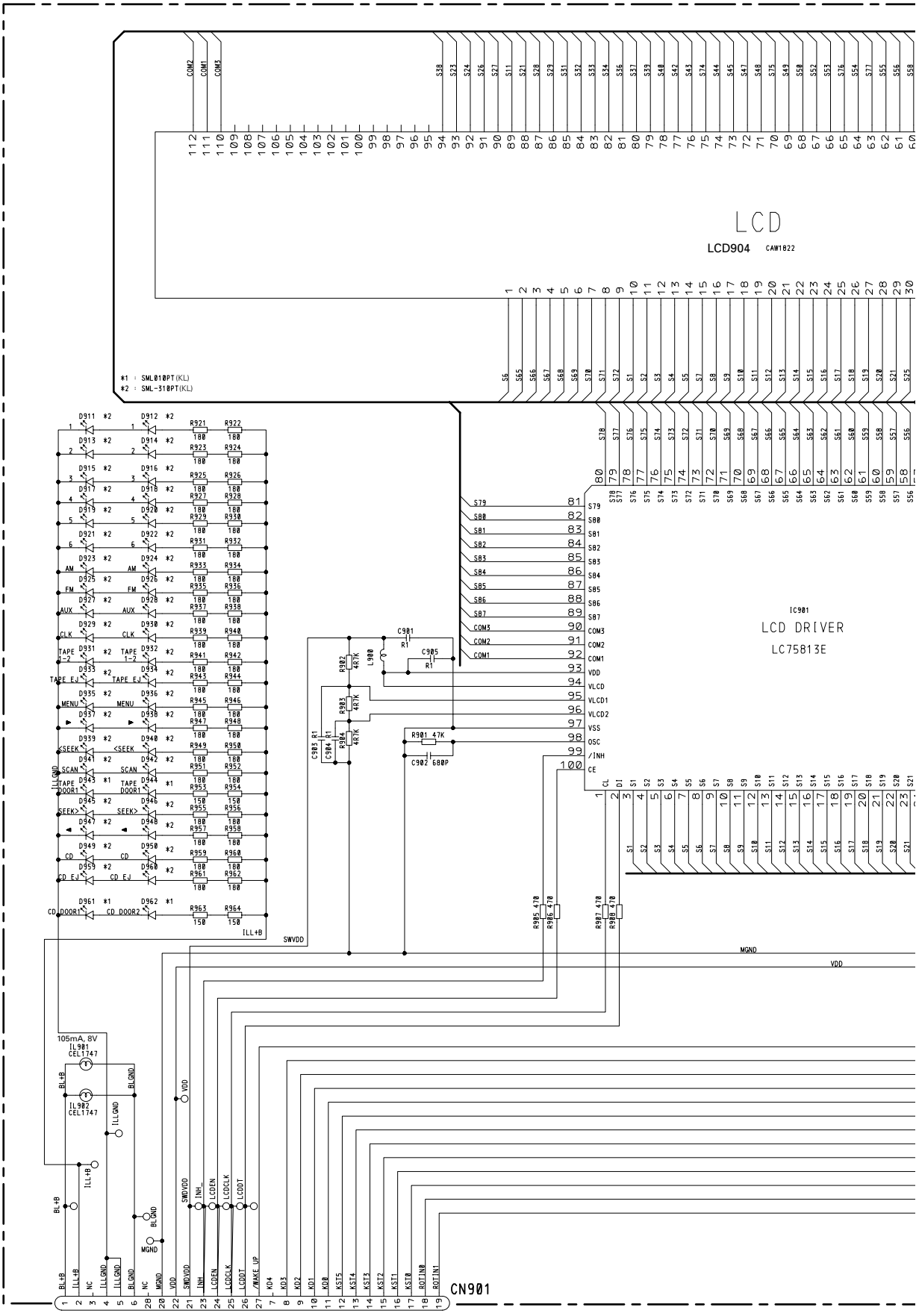

| J-1 | J-3 |
|---|---|
| 1 ILL + | |
| 2 ILL - | |
| 3 <START> | |
| 4 CLOCK | |
| 5 REAR Rch + | |
| 6 REAR Rch - | |
| 7 FRONT Rch + | |
| 8 FRONT Rch - | |
| 9 B.UP | |
| 10 ACC | NC(PTA) |
| 11 RADIO GND | NC(PHONE INPUT +) |
| 12 REAR Lch + | NC(PHONE INPUT -) |
| 13 REAR Lch - | NC(PHONE SHIELD) |
| 14 FRONT Lch + | |
| 15 FRONT Lch - | |
| 16 POWER AMP GND | |
| 17 | |
| 18 | |
| 19 | |
| 20 | |

NOTE :

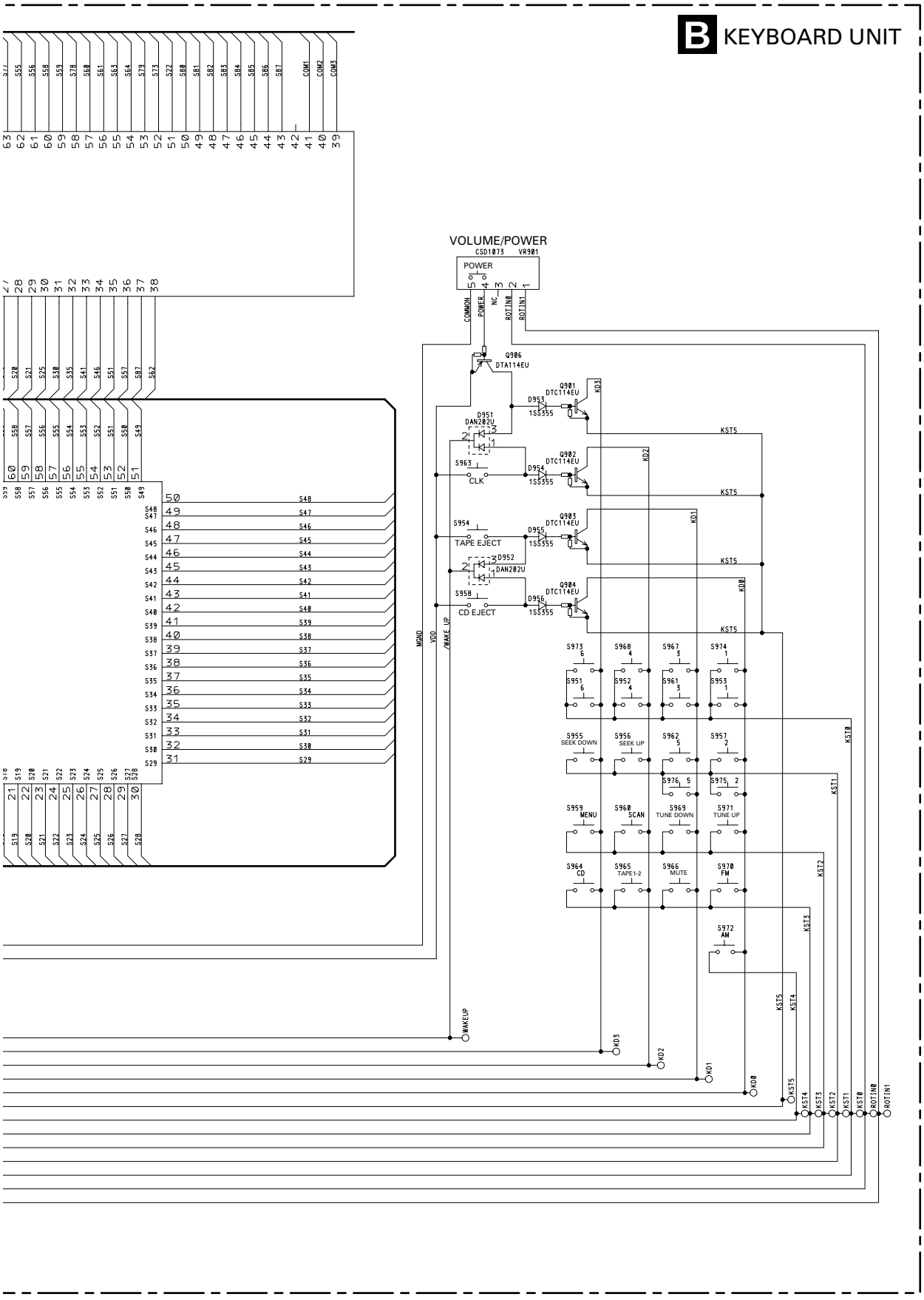
- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as :
2.2→2R2
0.022→R022

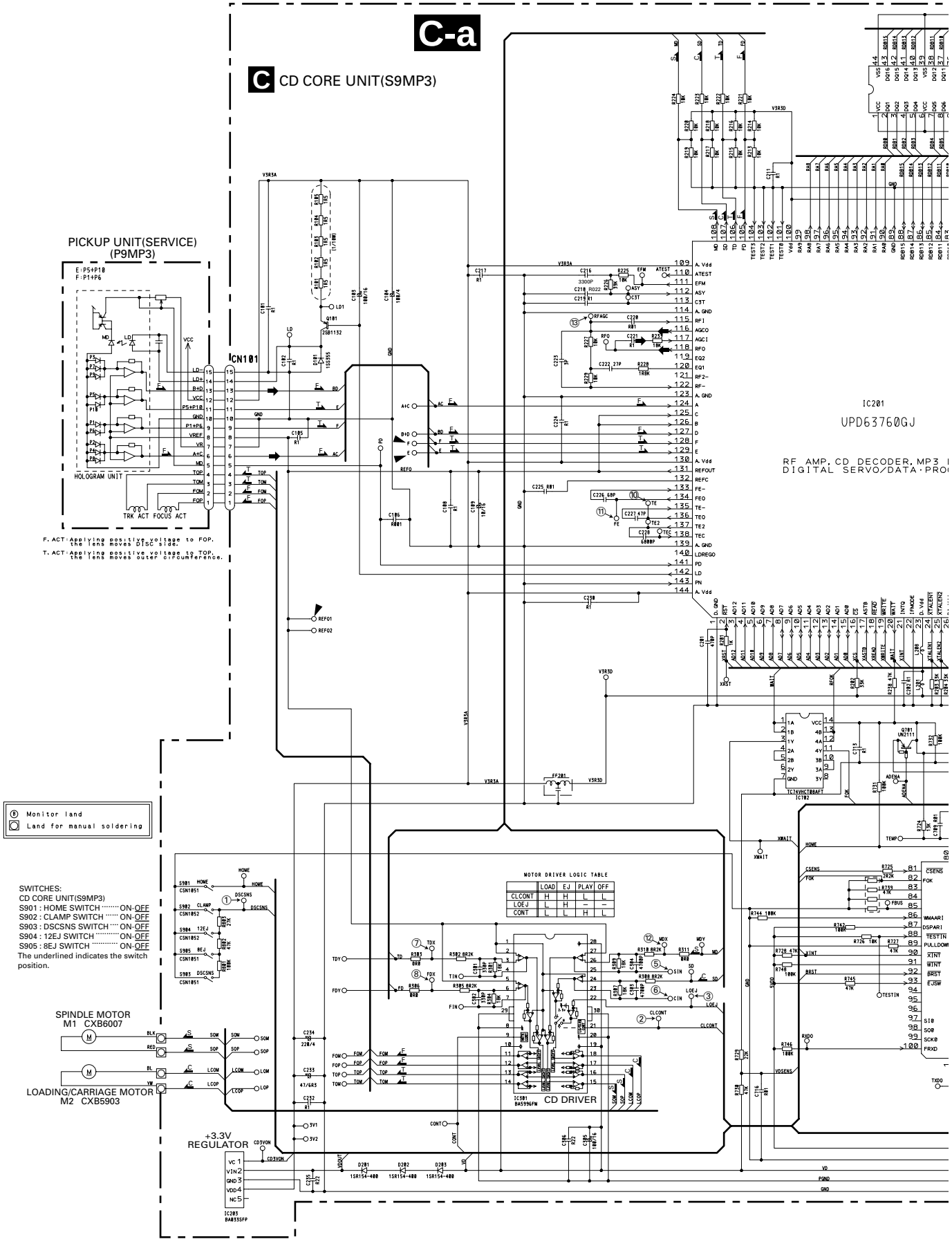
# 3.3 KEYBOARD UNIT



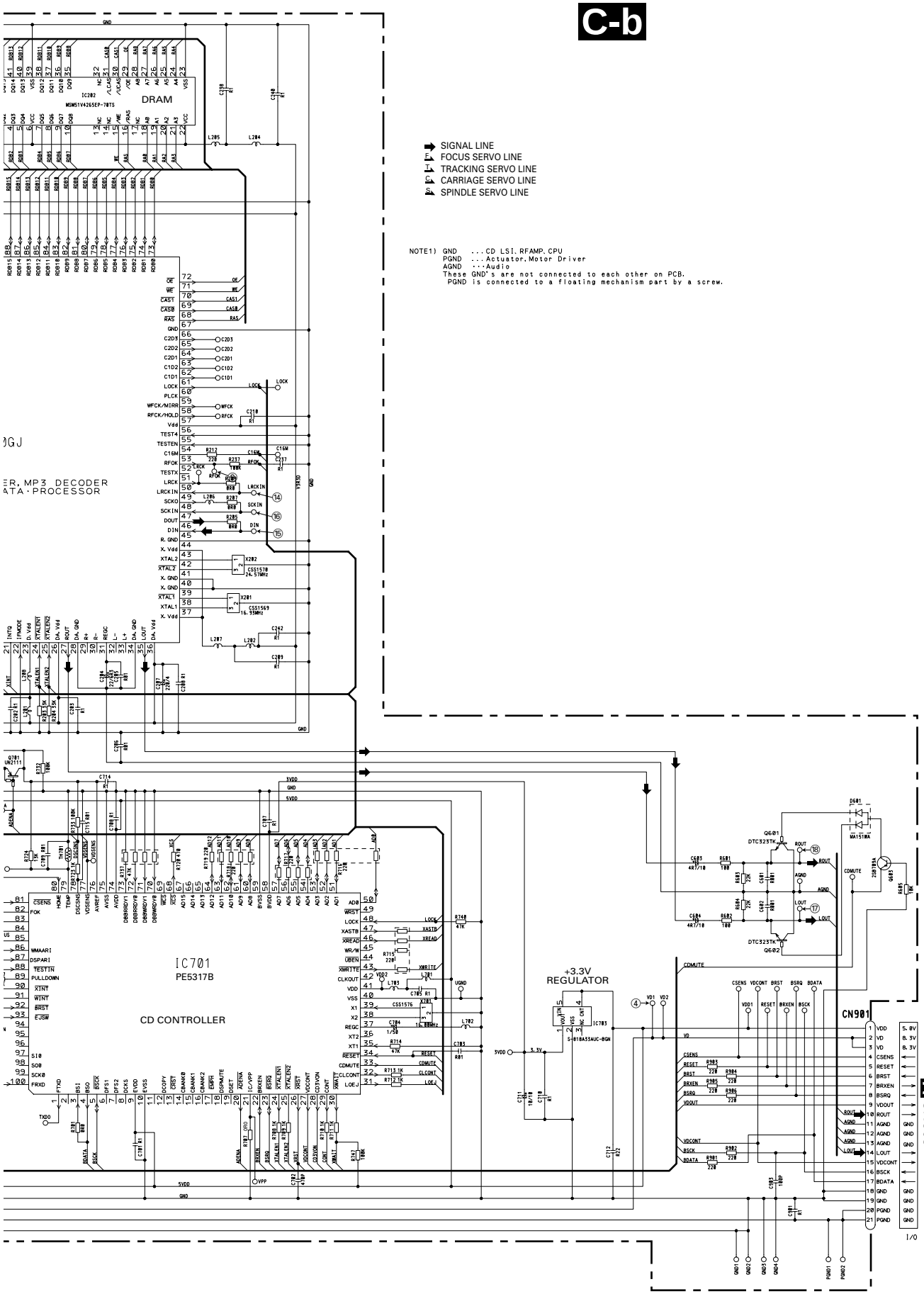
# B KEYBOARD UNIT

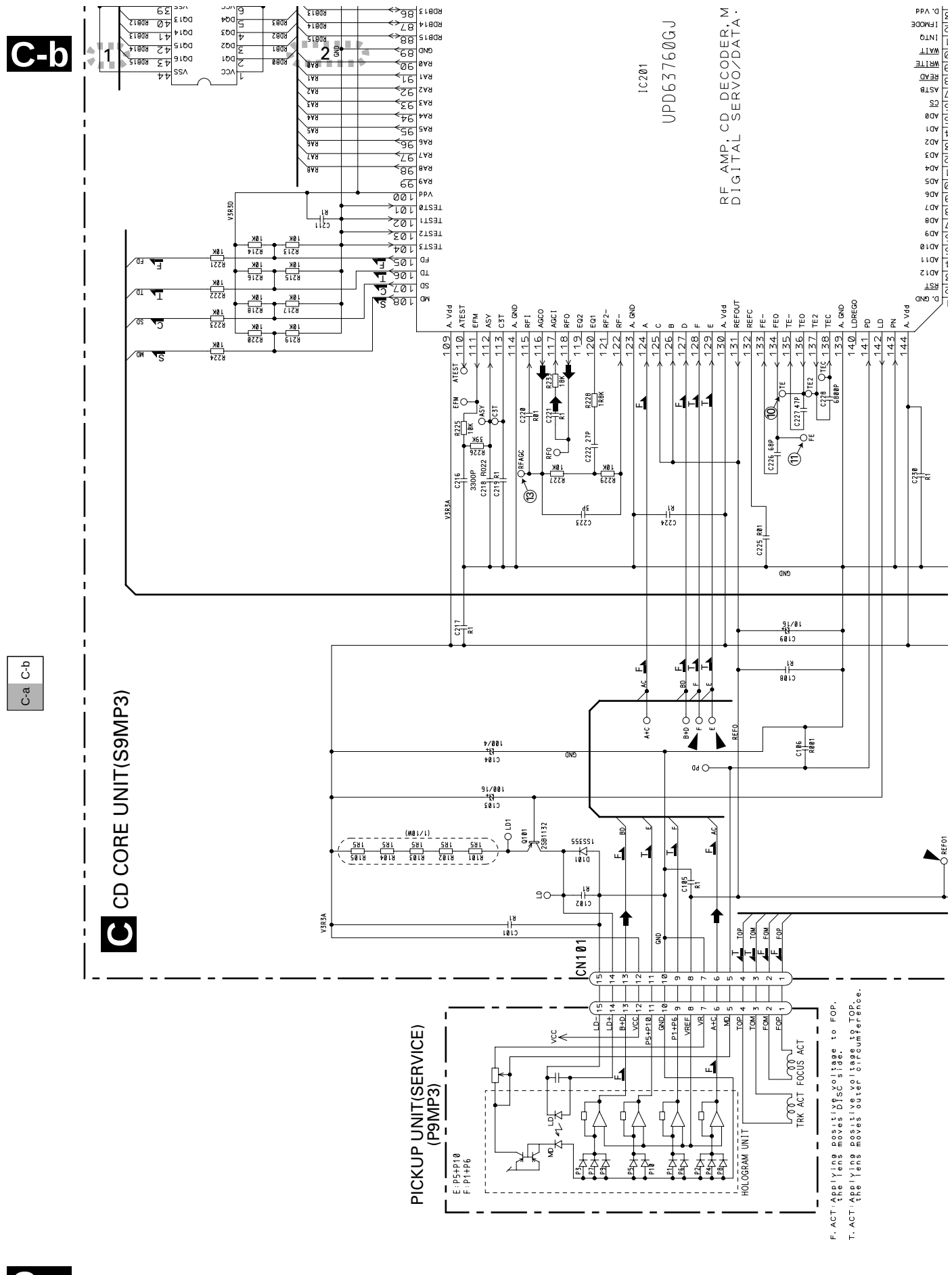


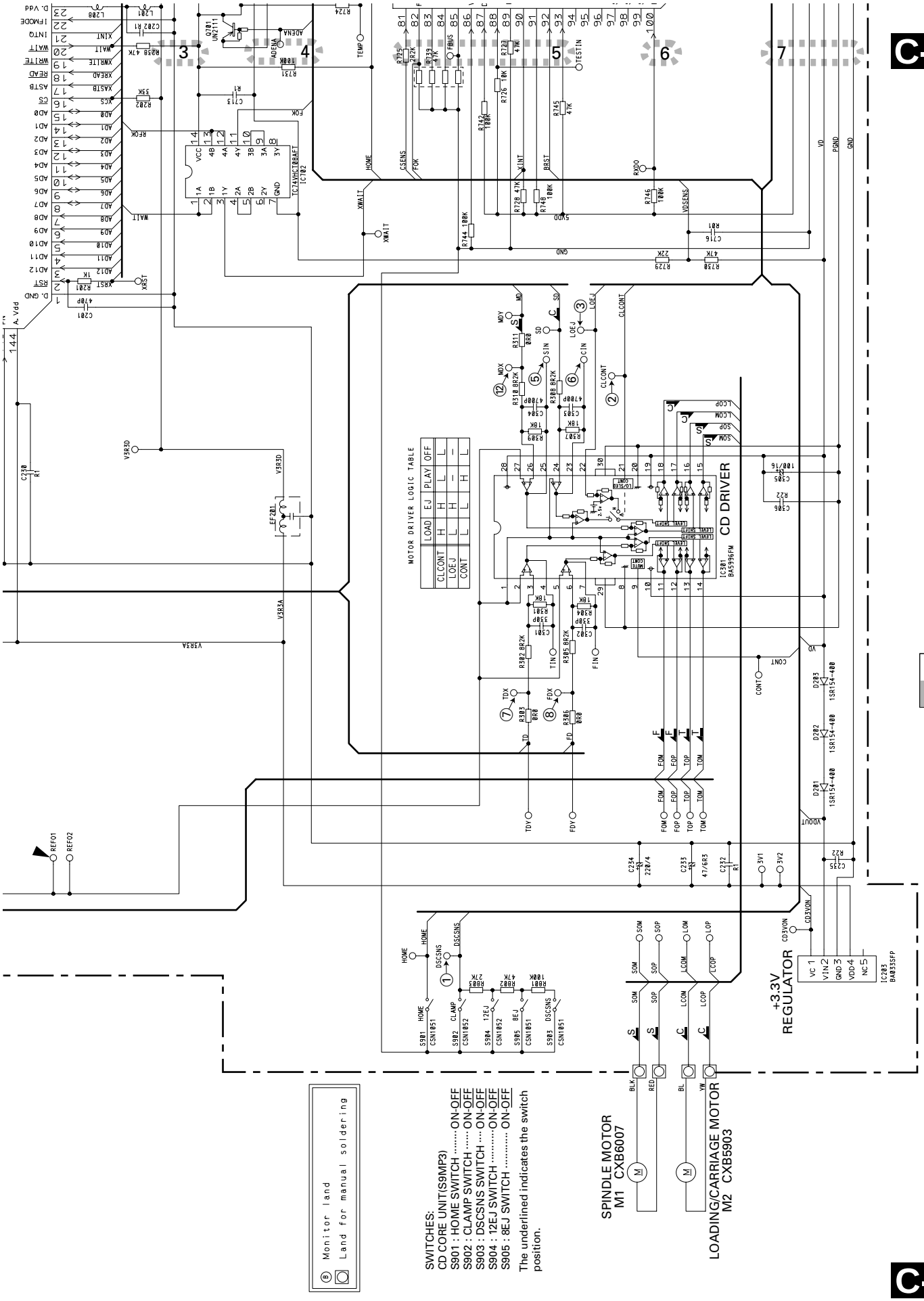
# 3.4 CD MECHANISM MODULE(GUIDE PAGE)



# C-b


SIGNAL LINE
FOCUS SERVO LINE
TRACKING SERVO LINE
CARRIAGE SERVO LINE
SPINDLE SERVO LINE
NOTE1) GND ...CD LSI, RFAMP, CPU
PGND ...Actuator, Motor Driver
AGND ...Audio
These GND's are not connected to each other on PCB.
PGND is connected to a floating mechanism part by a screw.
DRAM
IC701
PE5317B
CD CONTROLLER
+3.3V
REGULATOR
CN901
CN608
I/O


C-b
C-a C-b
C CD CORE UNIT(S9MP3)
IC201
UPD63760GJ
RF AMP, CD DECODER, M
DIGITAL SERVO/DATA.
CN101
PICKUP UNIT(SERVICE)
(P9MP3)
E:P5+P10
F:P1+P6
HOLOGRAM UNIT
TRK ACT FOCUS ACT
F. ACT:Applying positive voltage to FOP, the lens moves DISC side.
T. ACT:Applying positive voltage to TOP, the lens moves outer circumference.
C-a


C-b
C-a
MOTOR DRIVER LOGIC TABLE
LOAD EJ PLAY OFF
CLCONT H H L L
LOEJ L H – –
CONT L L H L
CD DRIVER
IC301 BA5936FM
+3.3V REGULATOR
IC203 BA033SFP
SPINDLE MOTOR
M1 CXB6007
LOADING/CARRIAGE MOTOR
M2 CXB5903
SWITCHES:
CD CORE UNIT(S9MP3)
S901 : HOME SWITCH ..... ON-OFF
S902 : CLAMP SWITCH ..... ON-OFF
S903 : DSCSNS SWITCH .... ON-OFF
S904 : 12EJ SWITCH ..... ON-OFF
S905 : 8EJ SWITCH ..... ON-OFF
The underlined indicates the switch position.
Monitor land
Land for manual soldering

A

B

C

D

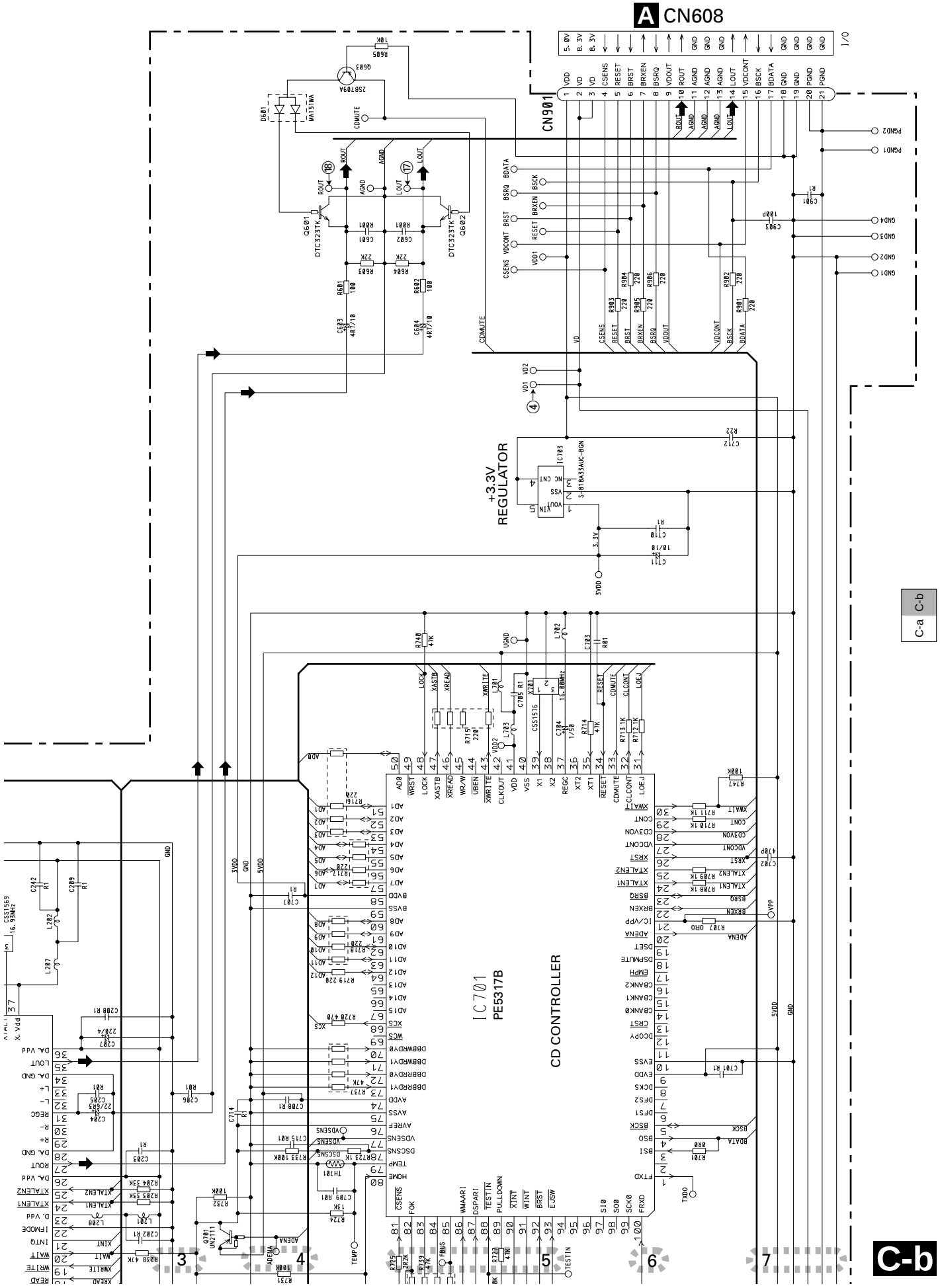
E

F

C-a C-b

SIGNAL LINE
FOCUS SERVO LINE
TRACKING SERVO LINE
CARRIAGE SERVO LINE
SPINDLE SERVO LINE

NOTE1) GND ...CD LSI, RFAMP, CPU
PGND ...Actuator, Motor Driver
AGND ...Audio
These GND's are not connected to each other on PCB.
PGND is connected to a floating mechanism part by a screw.

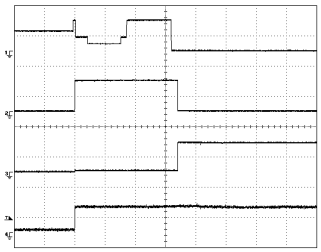

A CN608
CN901
+3.3V REGULATOR
CD CONTROLLER
IC701
PE5317B
C-a C-b
C-b

Note:1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage
REFO1 : 1.65V

## ● Waveforms

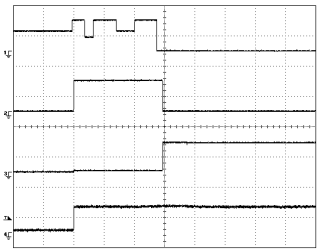
① CH1:DSCSNS 5V/div.
② CH2:CLCONT 5V/div.
③ CH3:LOEJ 5V/div. 500ms/div.
④ CH4:VD 10V/div.
When loading a 12cm CD

Ref. : GND
Mode : Normal



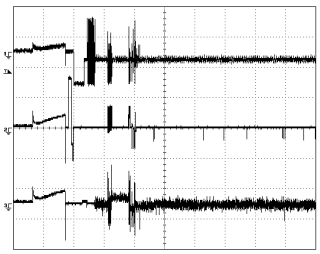
① CH1:DSCSNS 5V/div.
② CH2:CLCONT 5V/div.
③ CH3:LOEJ 5V/div. 500ms/div.
④ CH4:VD 10V/div.
When loading an 8cm CD

Ref. : GND
Mode : Normal



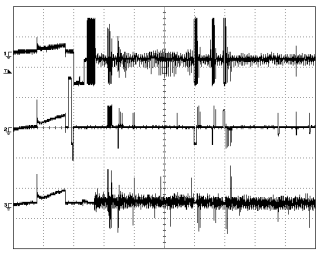
⑤ CH1:SIN 1V/div.
⑥ CH2:CIN 500mV/div. 2s/div.
⑦ CH3:TIN 500mV/div.
When setting up after loading a 12cm CD-DA disc

Ref. : REFO
Mode : Normal



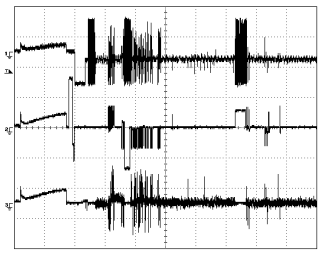
⑤ CH1:SIN 1V/div.
⑥ CH2:CIN 500mV/div. 2s/div.
⑦ CH3:TIN 500mV/div.
When setting up after loading a 12cm CD-ROM(1 session)

Ref. : REFO
Mode : Normal



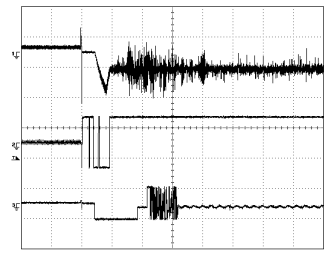
⑤ CH1:SIN 1V/div.
⑥ CH2:CIN 500mV/div. 2s/div.
⑦ CH3:TIN 500mV/div.
When setting up after loading a 12cm CD-ROM(2 session)

Ref. : REFO
Mode : Normal



⑧ CH1:FIN 200mV/div.
⑨ CH2:RFOK 2V/div. 500ms/div.
⑤ CH3:SIN 2V/div.
When setting up "Source On" (12cm CD-DA)

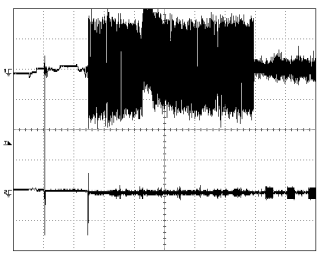
Ref. : REFO
Mode : Normal



⑩ CH1:TE 500mV/div.
⑪ CH2:FE 500mV/div. 200ms/div.

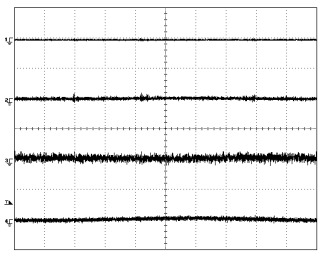
When setting up "Source On"

Ref. : REFO
Mode : Normal



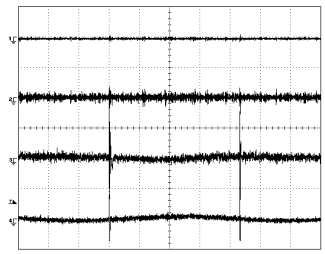
⑪ CH1:FE 500mV/div.
⑧ CH2:FIN 500mV/div. 20ms/div.
⑩ CH3:TE 500mV/div.
⑦ CH4:TIN 500mV/div.
During "Play" (CD-DA)

Ref. : REFO
Mode : Normal



⑪ CH1:FE 500mV/div.
⑧ CH2:FIN 500mV/div. 20ms/div.
⑩ CH3:TE 500mV/div.
⑦ CH4:TIN 500mV/div.
During "Play"(CD-ROM, generating 1Track Jump periodically) Refer to "1Track Jump."

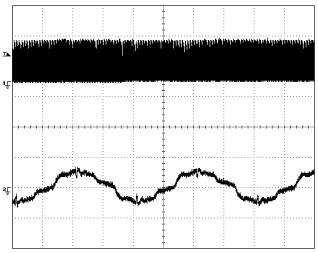
Ref. : REFO
Mode : Normal



⑫ CH1:MDX 500mV/div.
⑤ CH2:SIN 1V/div. 5ms/div.

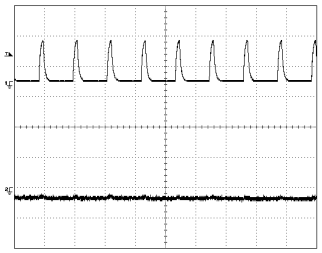
Spindle waveform during "Play"

Ref. : REFO
Mode : Normal



⑫ CH1:MDX 500mV/div.
⑤ CH2:SIN 1V/div. 5µs/div.
Spindle waveform during "Play" (Magnified)

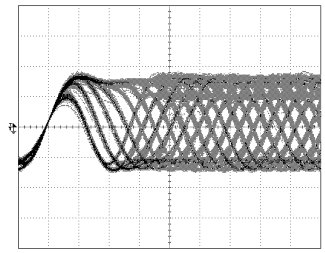
Ref. : REFO
Mode : Normal



⑬ CH1:RFAGC 500mV/div. 5µs/div.

RF eye pattern

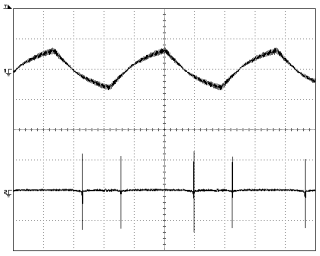
Ref. : REFO
Mode : Normal



⑧ CH1:FIN 500mV/div.
⑪ CH2:FE 500mV/div. 200ms/div.

Focus Search

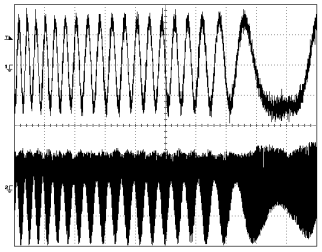
Ref. : REFO
Mode : TEST



⑩ CH1:TE 500mV/div.
⑬ CH2:RFAGC 500mV/div. 2ms/div.

When "Tracking Open"

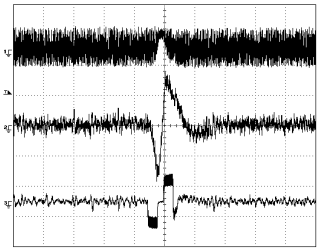
Ref. : REFO
Mode : TEST



⑬ CH1:RFAGC 1V/div.
⑩ CH2:TE 500mV/div. 500µs/div.
⑦ CH3:TIN 500mV/div.

1Track Jump

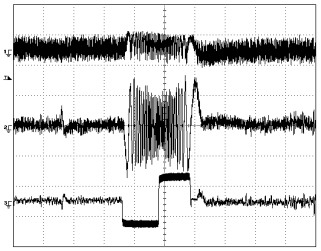
Ref. : REFO
Mode : TEST



⑬ CH1:RFAGC 1V/div.
⑩ CH2:TE 500mV/div. 1ms/div.
⑦ CH3:TIN 500mV/div.

32Track Jump

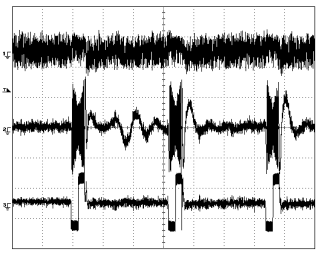
Ref. : REFO
Mode : TEST



⑬ CH1:RFAGC 1V/div.
⑩ CH2:TE 500mV/div. 5ms/div.
⑦ CH3:TIN 500mV/div.

100Track Jump

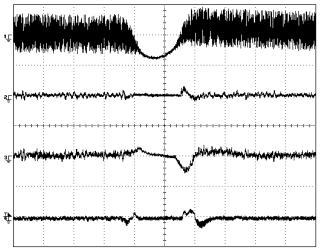
Ref. : REFO
Mode : TEST



⑬ CH1:RFAGC 1V/div.
⑦ CH2:TIN 1V/div.
⑩ CH3:TE 1V/div. 500µs/div.
⑧ CH4:FIN 1V/div.

When reproducing black dots(800µm)

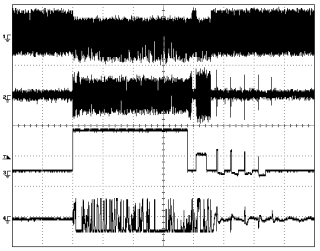
Ref. : REFO
Mode : Normal



⑬ CH1:RFAGC 1V/div.
⑩ CH2:TE 1V/div.
⑥ CH3:CIN 500mV/div. 500µs/div.
⑤ CH4:SIN 2V/div.

During inside/outside search (outer circumference → inner circumference)

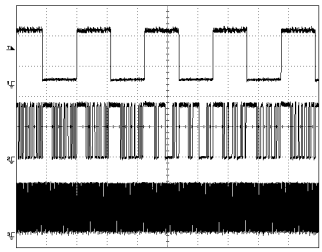
Ref. : REFO
Mode : Normal



⑭ CH1:LRCKIN 2V/div.
⑮ CH2:DIN 2V/div. 10µs/div.
⑯ CH3:SCKIN 2V/div.

Digital Audio

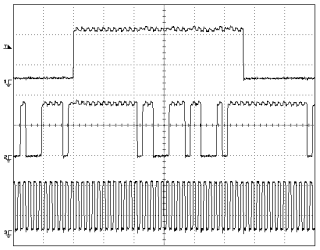
Ref. : GND
Mode : Normal



⑭ CH1:LRCKIN 2V/div.
⑮ CH2:DIN 2V/div. 2µs/div.
⑯ CH3:SCKIN 2V/div.

Digital Audio (Magnified)

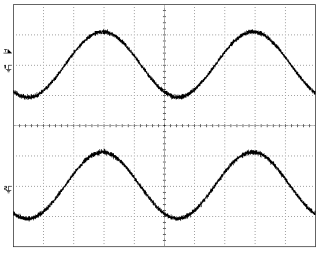
Ref. : REFO
Mode : Normal



⑰ CH1:LOUT 1V/div.
⑱ CH2:ROUT 1V/div. 200µs/div.

Analog Audio (Magnified)

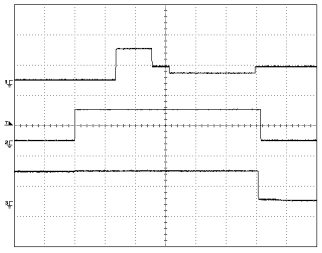
Ref. : AGND
Mode : Normal



① CH1:DSCSNS 5V/div.
② CH2:CLCONT 5V/div. 10µs/div.
③ CH3:LOEJ 5V/div.

When "Eject" (12cm CD)

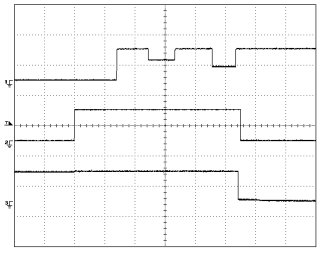
Ref. : GND
Mode : Normal



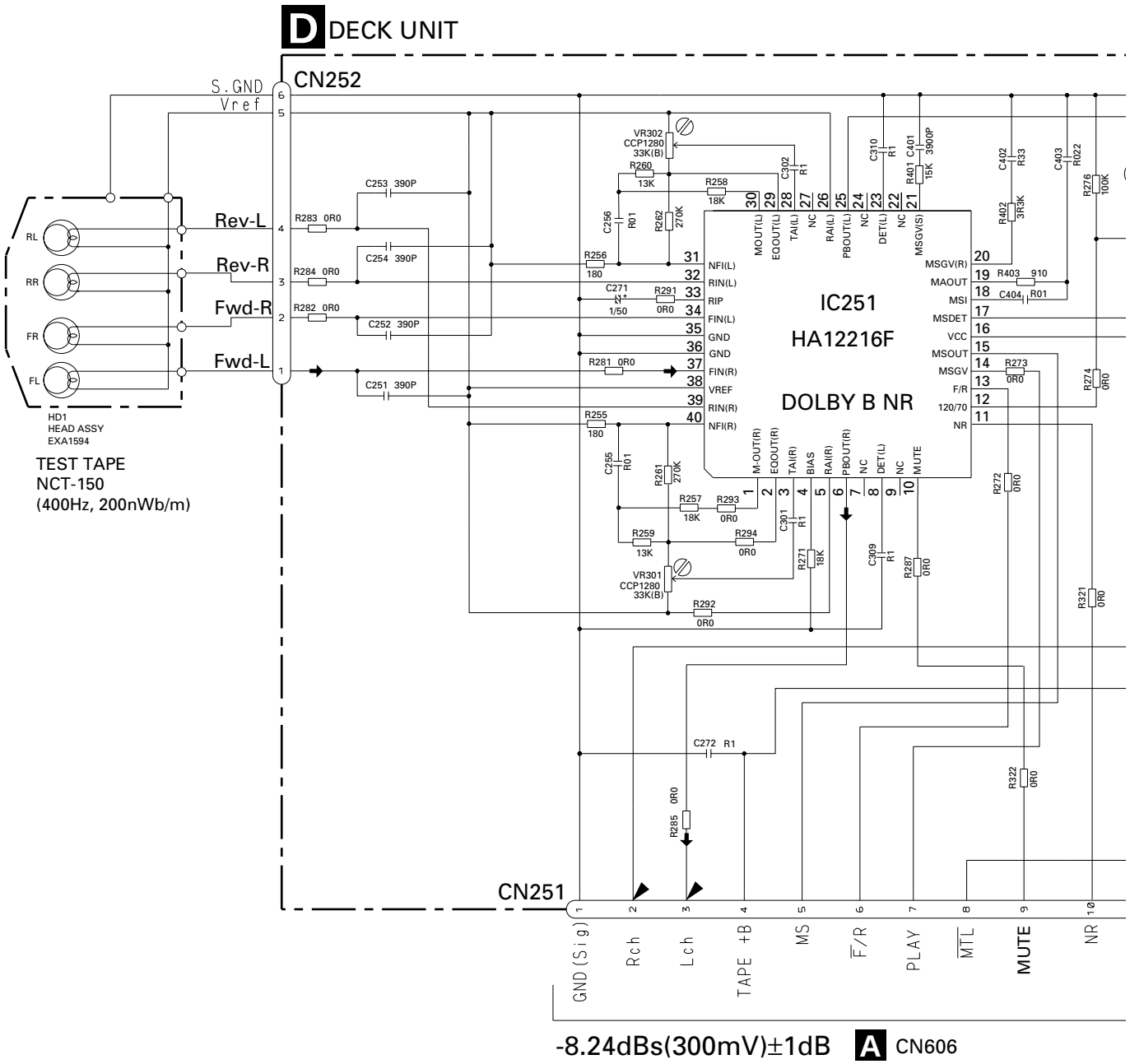
① CH1:DSCSNS 5V/div.
② CH2:CLCONT 5V/div. 10µs/div.
③ CH3:LOEJ 5V/div.

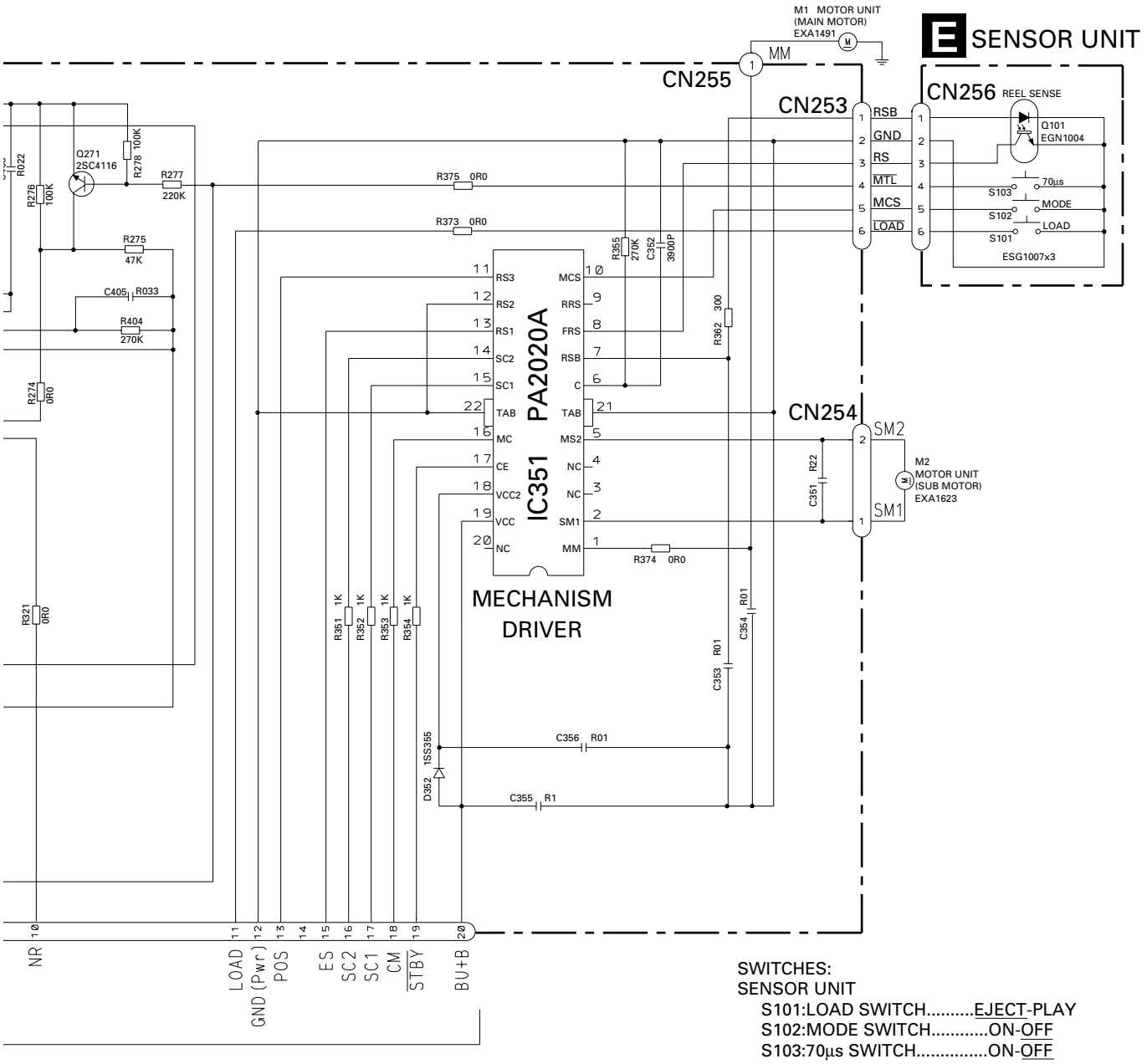
When "Eject" (8cm CD)

Ref. : GND
Mode : Normal



# 3.5 CASSETTE MECHANISM MODULE





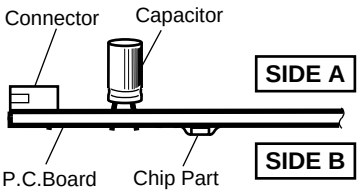

SWITCHES:
SENSOR UNIT
S101:LOAD SWITCH.....EJECT-PLAY
S102:MODE SWITCH.....ON-OFF
S103:70µs SWITCH.....ON-OFF
The underlined indicates the switch position.

# 4. PCB CONNECTION DIAGRAM

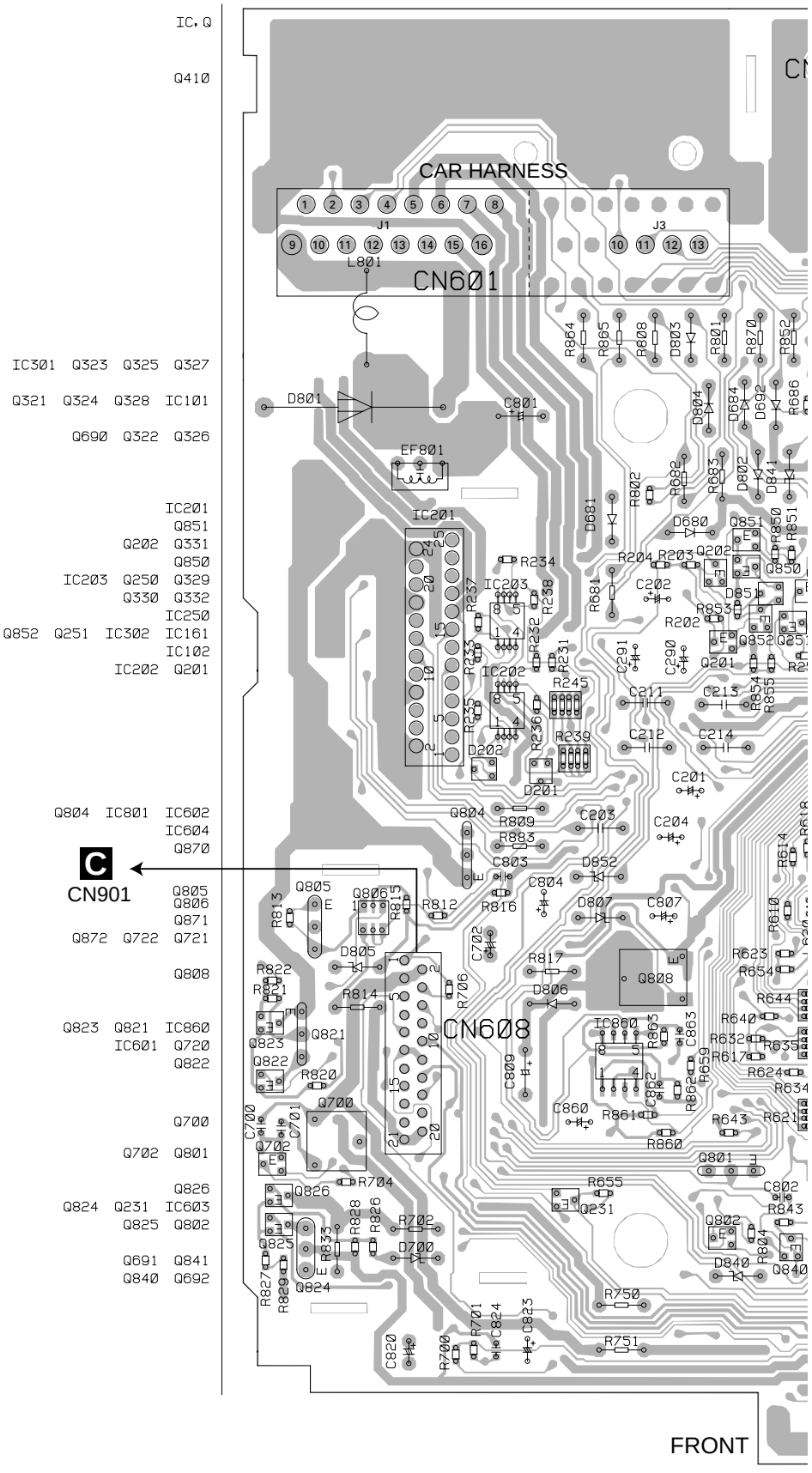
## 4.1 MOTHER UNIT

**NOTE FOR PCB DIAGRAMS**

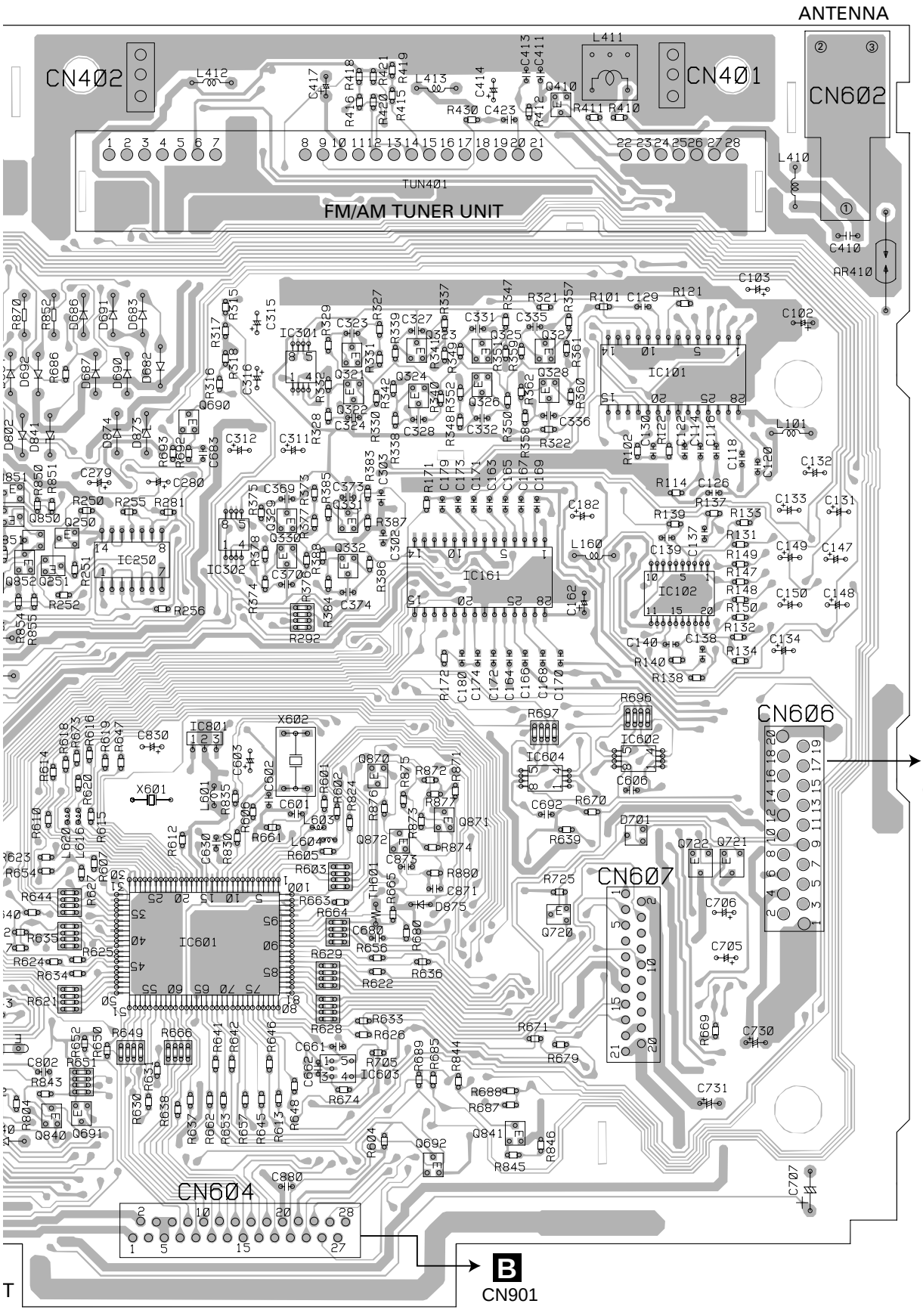
1. The parts mounted on this PCB include all necessary parts for several destination.
   For further information for respective destinations, be sure to check with the schematic diagram.
2. Viewpoint of PCB diagrams



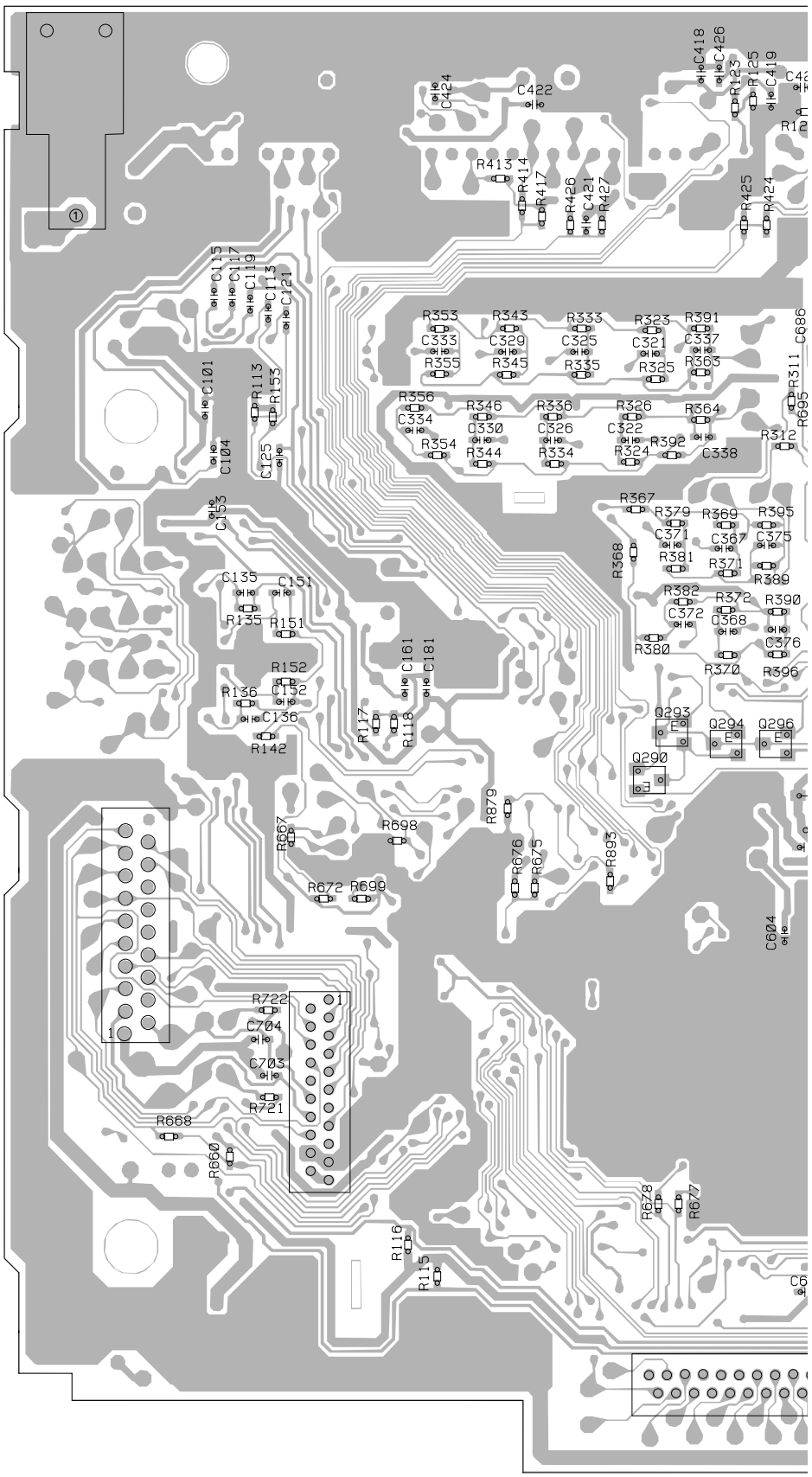

**A** MOTHER UNIT



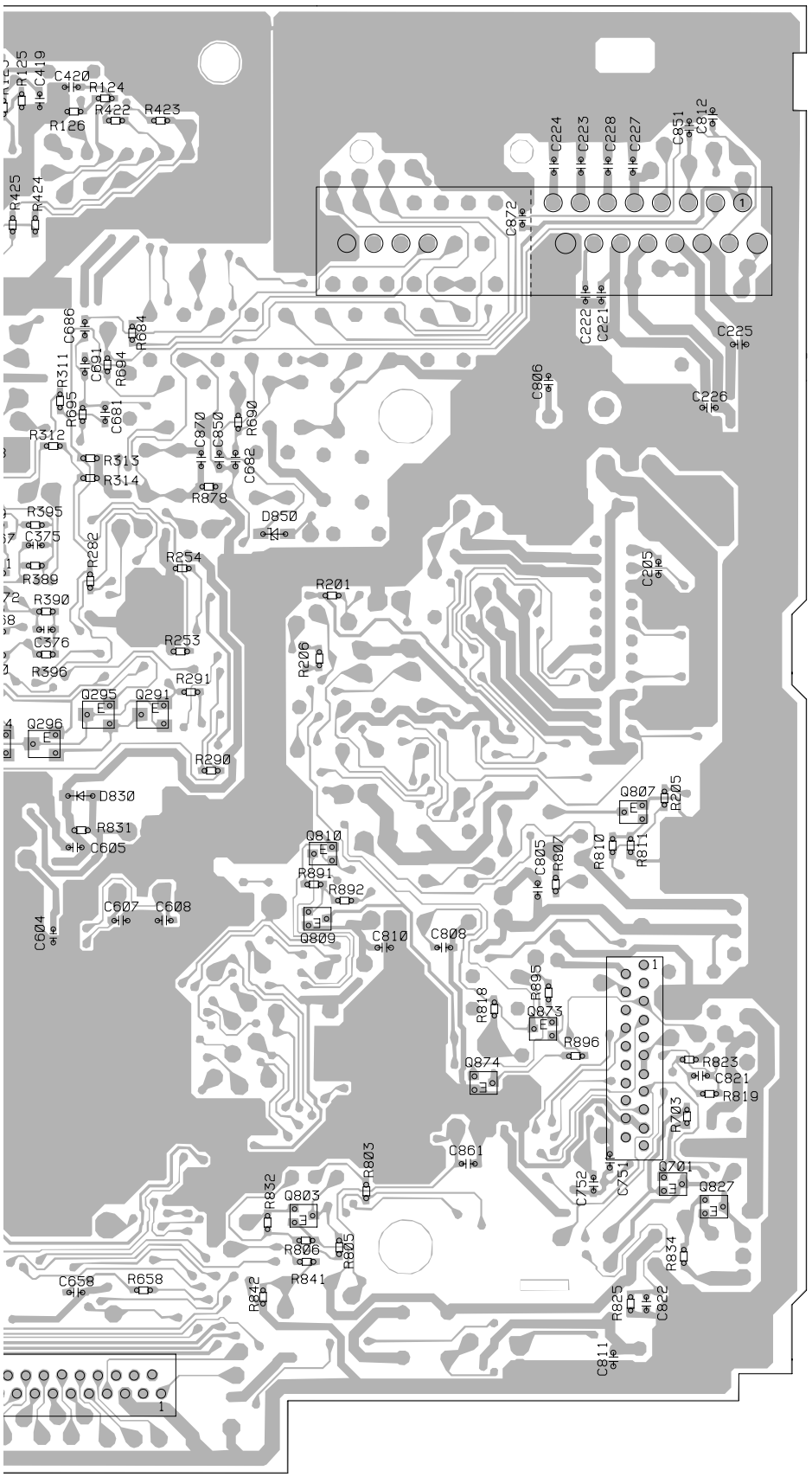

**A**


SIDE A
ANTENNA
CN402
CN401
CN602
L411
L412
L413
L410
TUN401
FM/AM TUNER UNIT
IC301
IC101
IC102
IC161
IC250
IC302
IC601
IC602
IC603
IC604
IC801
X601
X602
CN606
CN607
CN604
D
CN251
B
CN901
A

## A MOTHER UNIT



**SIDE B**




IC, Q

Q295 Q291
Q293
Q294 Q296
Q290

Q807

Q810

Q809

Q873

Q874

Q701

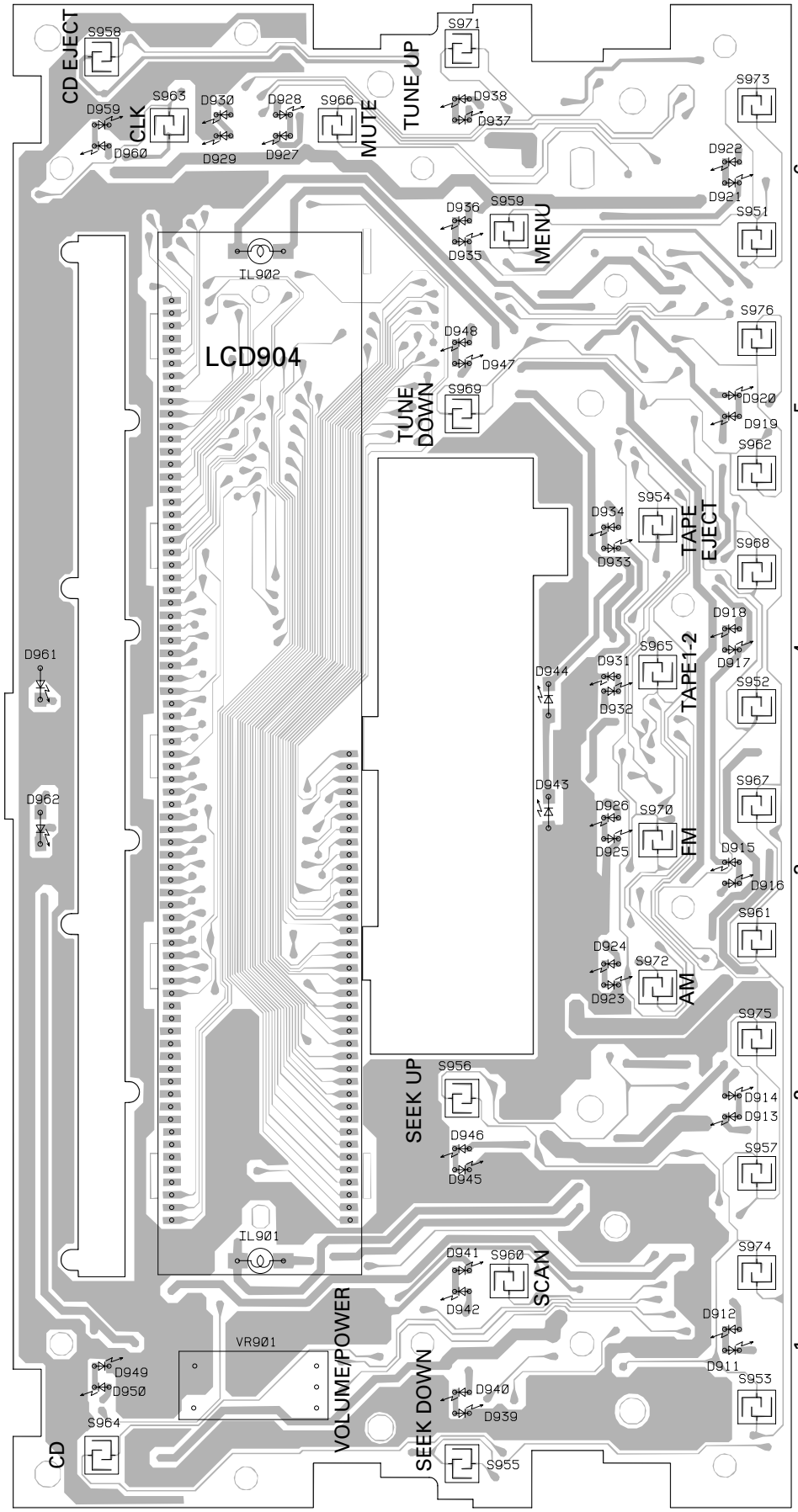
Q803 Q827

A

## 4.2 KEYBOARD UNIT

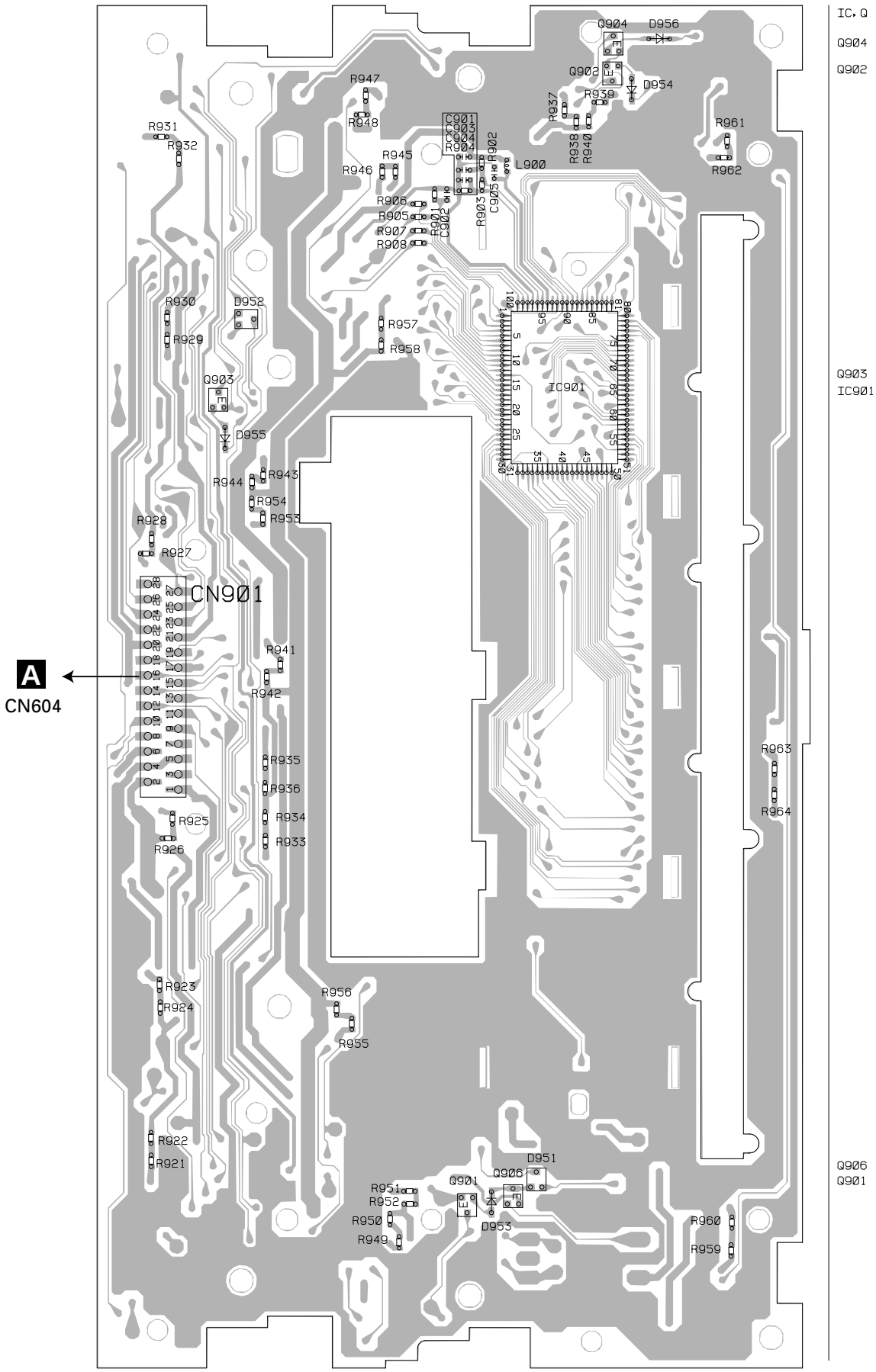
**B** KEYBOARD UNIT

**SIDE A**



# B KEYBOARD UNIT

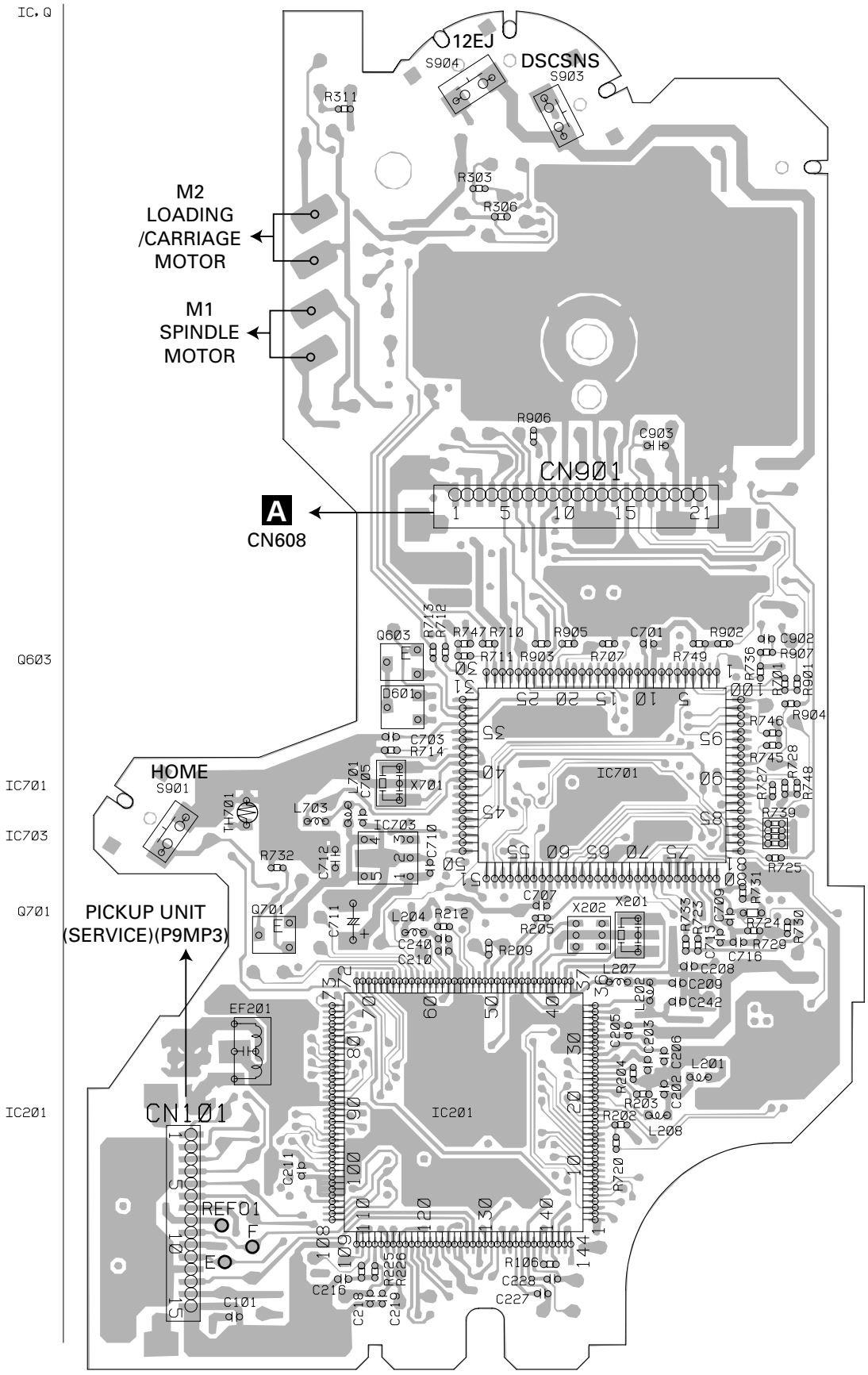
**SIDE B**



## 4.3 CD MECHANISM MODULE

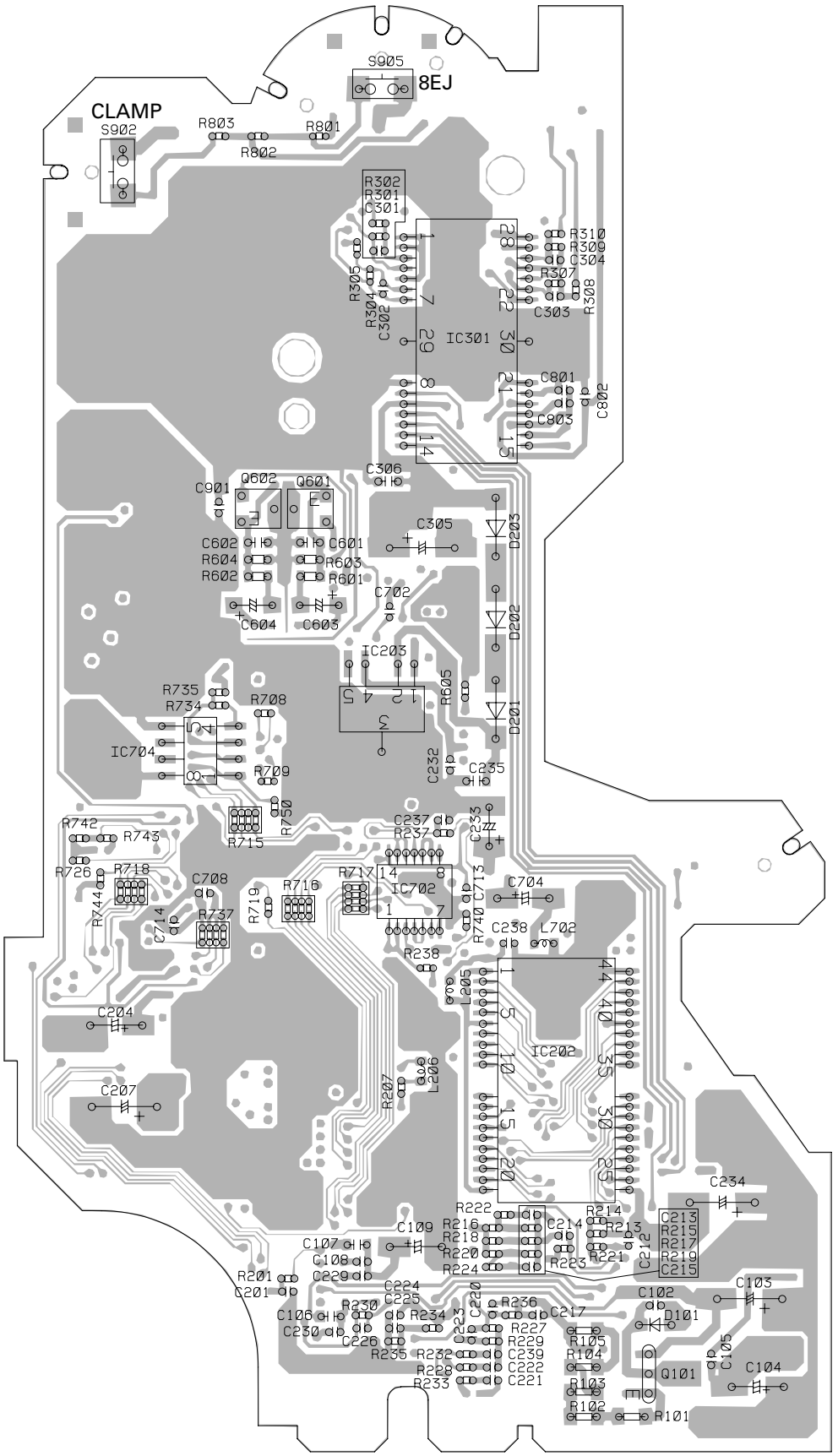
**C** CD CORE UNIT(S9MP3)

**SIDE A**



# C CD CORE UNIT(S9MP3)

**SIDE B**




IC, Q

IC301

Q602 Q601

IC203

IC704

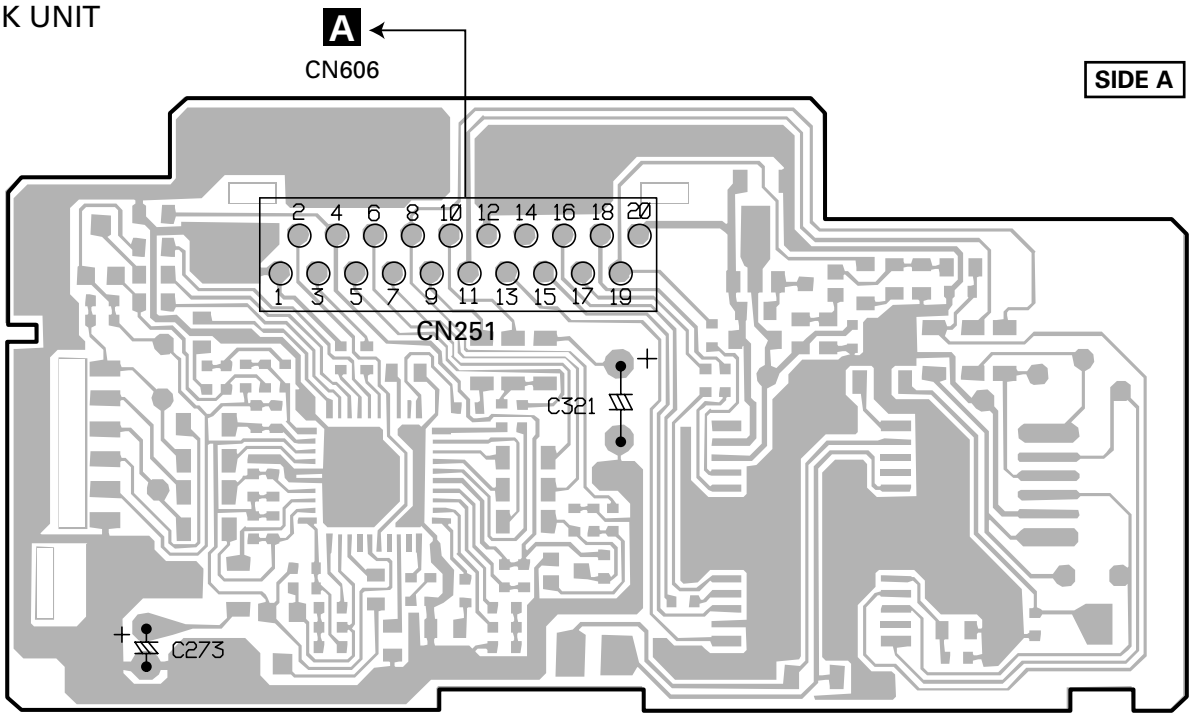
IC702

IC202

Q101

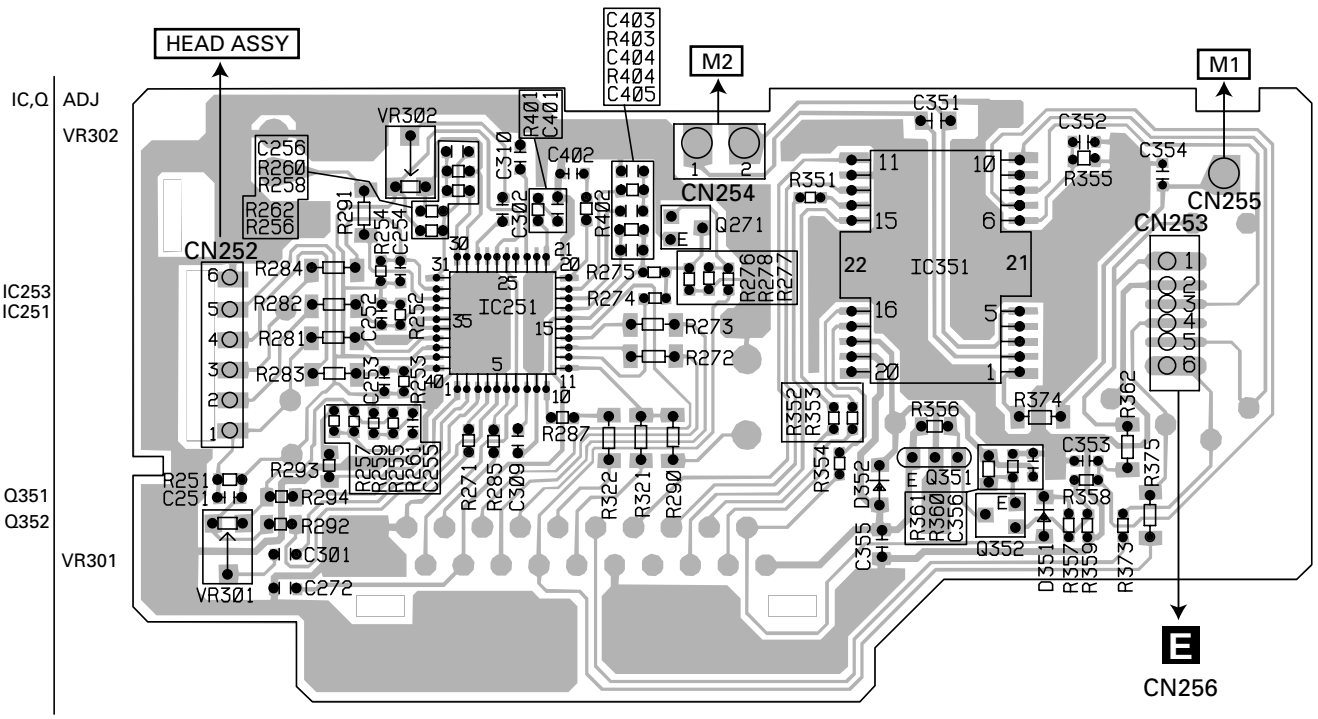
## 4.4 CASSETTE MECHANISM MODULE

**D** DECK UNIT



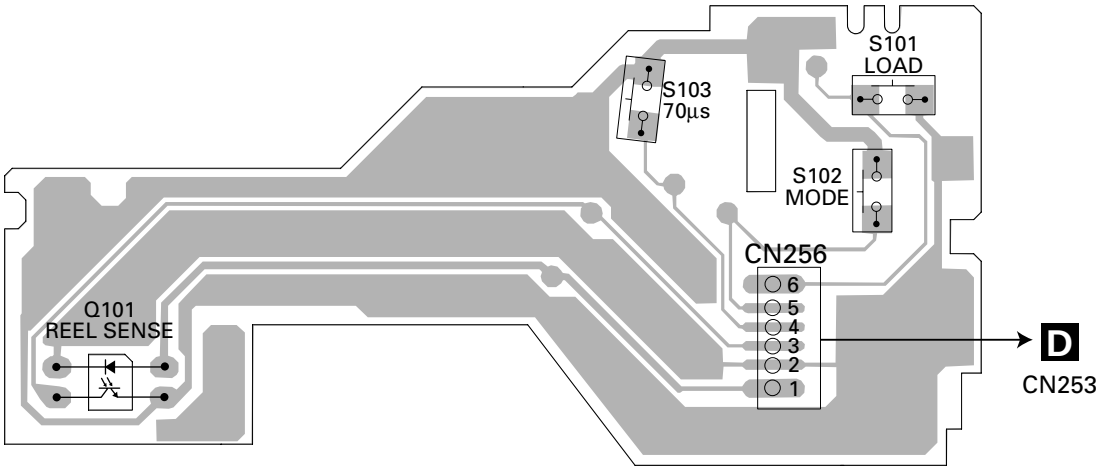

**D** DECK UNIT

SIDE B




**D**

# E SENSOR UNIT



# 5. ELECTRICAL PARTS LIST

**NOTES:**

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/○S○○○J,RS1/○○S○○○J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

**A** Unit Number : HWM0084
Unit Name : Mother Unit

MISCELLANEOUS

| =====Circuit Symbol and No. | | ===Part Name | Part No. |
|---|---|---|---|
| IC | 101 | IC | PML010A |
| IC | 201 | IC | TDA7384 |
| IC | 202 | IC | NJM2904V |
| IC | 203 | IC | NJM2904V |
| IC | 301 | IC | NJM2068V |
| IC | 302 | IC | NJM2068V |
| IC | 601 | IC | PD5755A |
| IC | 603 | IC | TC7S86F |
| IC | 604 | IC | BR9010FV-W |
| IC | 801 | IC | S-80842CNDYI |
| Q | 201 | Transistor | DTC124EU |
| Q | 202 | Transistor | DTC124EU |
| Q | 231 | Transistor | DTC114EU |
| Q | 321 | Transistor | 2SC4081 |
| Q | 322 | Transistor | 2SC4081 |
| Q | 323 | Transistor | 2SC4081 |
| Q | 324 | Transistor | 2SC4081 |
| Q | 325 | Transistor | 2SC4081 |
| Q | 326 | Transistor | 2SC4081 |
| Q | 327 | Transistor | 2SC4081 |
| Q | 328 | Transistor | 2SC4081 |
| Q | 329 | Transistor | 2SC4081 |
| Q | 330 | Transistor | 2SC4081 |
| Q | 410 | Transistor | 2SC4081 |
| Q | 691 | Transistor | DTA114EU |
| Q | 692 | Transistor | DTC124EU |
| Q | 700 | Transistor | KSD1273 |
| Q | 701 | Transistor | 2SA1576 |
| Q | 702 | Transistor | DTC114EU |
| Q | 720 | Transistor | DTA124EU |
| Q | 721 | Transistor | DTC343TK |
| Q | 722 | Transistor | DTC343TK |
| Q | 804 | Transistor | 2SB1236 |
| Q | 805 | Transistor | KSB1366 |
| Q | 806 | Transistor | IMX1 |
| Q | 807 | Transistor | 2SC4081 |
| Q | 808 | Transistor | 2SD2318F5 |
| Q | 809 | Transistor | 2SA1576 |
| Q | 810 | Transistor | DTC114EU |
| Q | 821 | Transistor | 2SB942A |
| Q | 822 | Transistor | 2SC4081 |
| Q | 823 | Transistor | 2SC4081 |
| Q | 824 | Transistor | KSA1220 |
| Q | 825 | Transistor | 2SC4081 |
| Q | 826 | Transistor | 2SC4081 |
| Q | 827 | Transistor | 2SA1576 |
| Q | 840 | Transistor | 2SC4081 |
| Q | 841 | Transistor | 2SC4081 |
| Q | 850 | Transistor | DTA144EU |
| Q | 851 | Transistor | 2SC4081 |
| Q | 852 | Transistor | 2SC4081 |
| Q | 870 | Transistor | DTA124EU |
| Q | 871 | Transistor | 2SC4081 |
| Q | 872 | Transistor | 2SC4081 |
| Q | 873 | Transistor | 2SA1576 |
| Q | 874 | Transistor | DTC114EU |
| D | 201 | Diode | DAN202U |
| D | 202 | Diode | DAN202U |
| D | 700 | Diode | HZS9L(B1) |
| D | 701 | Diode | DAP202U |
| D | 801 | Diode | RM4Z-LFJ4 |
| D | 802 | Diode | ERA15-02VH |
| D | 805 | Diode | HZS9L(A1) |
| D | 806 | Diode | ERA15-02VH |
| D | 807 | Diode | HZS6L(B2) |
| D | 830 | Diode | 1SS355 |
| D | 840 | Diode | HZS7L(C2) |
| D | 841 | Diode | HZS9L(A2) |
| D | 850 | Diode | UDZS5R6(B) |
| D | 851 | Diode | DAN202U |
| D | 852 | Diode | HZS9L(B2) |
| D | 873 | Diode | HZS12L(C1) |
| D | 874 | Diode | 1SS133 |
| D | 875 | Diode | MA732 |
| L | 101 | Inductor | LAU2R2K |
| L | 410 | Ferri-Inductor | LAU4R7K |
| L | 411 | Coil | CTB1103 |
| L | 412 | Inductor | LAU2R2K |
| L | 413 | Inductor | LAU2R2K |
| L | 601 | Inductor | LCTA2R2J2520 |
| L | 603 | Inductor | HTF0002 |
| L | 604 | Inductor | HTF0002 |
| L | 607 | Inductor | HTF0002 |
| L | 616 | Inductor | HTF0002 |
| L | 620 | Inductor | HTF0002 |
| L | 627 | Inductor | HTF0002 |
| L | 801 | Choke Coil 600µH | CTH1243 |
| X | 601 | Radiator 16.000MHz | CSS1571 |
| X | 602 | Radiator 32.768kHz | CSS1319 |
| EF | 801 | EMI Filter | HCG0001 |
| AR | 410 | Surge Protector | DSP-201M-S00B |
| | | FM/AM Tuner Unit | CWE1561 |

RESISTORS

| | | | |
|---|---|---|---|
| R | 115 | | RS1/16S273J |
| R | 116 | | RS1/16S273J |
| R | 117 | | RS1/16S272J |
| R | 118 | | RS1/16S272J |
| R | 121 | | RS1/16S0R0J |
| R | 122 | | RS1/16S0R0J |
| R | 123 | | RS1/16S302J |
| R | 124 | | RS1/16S302J |
| R | 125 | | RS1/16S132J |
| R | 126 | | RS1/16S132J |

| =====Circuit Symbol and No. | Part Name | Part No. |
|---|---|---|
| R 201 | | RS1/16S103J |
| R 202 | | RS1/16S221J |
| R 203 | | RS1/16S153J |
| R 204 | | RS1/16S101J |
| R 205 | | RS1/16S103J |
| R 206 | | RS1/16S0R0J |
| R 231 | | RS1/16S103J |
| R 232 | | RS1/16S103J |
| R 233 | | RS1/16S103J |
| R 234 | | RS1/16S103J |
| R 235 | | RS1/16S103J |
| R 236 | | RS1/16S103J |
| R 237 | | RS1/16S103J |
| R 238 | | RS1/16S103J |
| R 239 | | RAB4C682J |
| R 245 | | RAB4C821J |
| R 281 | | RS1/16S0R0J |
| R 282 | | RS1/16S0R0J |
| R 311 | | RS1/16S0R0J |
| R 312 | | RS1/16S0R0J |
| R 315 | | RS1/16S0R0J |
| R 316 | | RS1/16S0R0J |
| R 321 | | RS1/16S512J |
| R 322 | | RS1/16S512J |
| R 325 | | RS1/16S822J |
| R 326 | | RS1/16S822J |
| R 327 | | RS1/16S122J |
| R 328 | | RS1/16S122J |
| R 329 | | RS1/16S683J |
| R 330 | | RS1/16S683J |
| R 331 | | RS1/16S472J |
| R 332 | | RS1/16S472J |
| R 333 | | RS1/16S562J |
| R 334 | | RS1/16S562J |
| R 337 | | RS1/16S122J |
| R 338 | | RS1/16S122J |
| R 339 | | RS1/16S683J |
| R 340 | | RS1/16S683J |
| R 341 | | RS1/16S472J |
| R 342 | | RS1/16S472J |
| R 343 | | RS1/16S0R0J |
| R 344 | | RS1/16S0R0J |
| R 347 | | RS1/16S122J |
| R 348 | | RS1/16S122J |
| R 349 | | RS1/16S683J |
| R 350 | | RS1/16S683J |
| R 351 | | RS1/16S472J |
| R 352 | | RS1/16S472J |
| R 355 | | RS1/16S272J |
| R 356 | | RS1/16S272J |
| R 357 | | RS1/16S122J |
| R 358 | | RS1/16S122J |
| R 359 | | RS1/16S683J |
| R 360 | | RS1/16S683J |
| R 361 | | RS1/16S472J |
| R 362 | | RS1/16S472J |
| R 363 | | RS1/16S512J |
| R 364 | | RS1/16S512J |
| R 367 | | RS1/16S512J |
| R 368 | | RS1/16S512J |
| R 369 | | RS1/16S182J |
| R 370 | | RS1/16S182J |
| R 373 | | RS1/16S122J |
| R 374 | | RS1/16S122J |
| R 375 | | RS1/16S683J |
| R 376 | | RS1/16S683J |
| R 377 | | RS1/16S472J |
| R 378 | | RS1/16S472J |
| R 389 | | RS1/16S512J |
| R 390 | | RS1/16S512J |

| =====Circuit Symbol and No. | Part Name | Part No. |
|---|---|---|
| R 410 | | RS1/16S222J |
| R 412 | | RS1/16S222J |
| R 413 | | RS1/16S473J |
| R 414 | | RS1/16S681J |
| R 415 | | RS1/16S681J |
| R 416 | | RS1/16S681J |
| R 417 | | RS1/16S473J |
| R 418 | | RS1/16S472J |
| R 419 | | RS1/16S473J |
| R 420 | | RS1/16S681J |
| R 421 | | RS1/16S473J |
| R 422 | | RS1/16S473J |
| R 423 | | RS1/16S473J |
| R 424 | | RS1/16S681J |
| R 425 | | RS1/16S681J |
| R 426 | | RS1/16S103J |
| R 427 | | RS1/16S393J |
| R 430 | | RS1/16S563J |
| R 601 | | RS1/16S471J |
| R 602 | | RS1/16S102J |
| R 603 | | RAB4C102J |
| R 604 | | RS1/16S473J |
| R 605 | | RS1/16S471J |
| R 606 | | RS1/16S102J |
| R 612 | | RS1/16S473J |
| R 614 | | RS1/16S102J |
| R 615 | | RS1/16S102J |
| R 616 | | RS1/16S471J |
| R 617 | | RS1/16S104J |
| R 619 | | RS1/16S0R0J |
| R 620 | | RS1/16S471J |
| R 621 | | RAB4C102J |
| R 622 | | RS1/16S102J |
| R 623 | | RS1/16S682J |
| R 624 | | RS1/16S0R0J |
| R 626 | | RS1/16S102J |
| R 628 | | RAB4C102J |
| R 629 | | RAB4C102J |
| R 631 | | RS1/16S473J |
| R 632 | | RS1/16S104J |
| R 633 | | RS1/16S681J |
| R 634 | | RS1/16S471J |
| R 635 | | RAB4C102J |
| R 636 | | RS1/16S102J |
| R 637 | | RS1/16S102J |
| R 638 | | RS1/16S102J |
| R 639 | | RS1/16S103J |
| R 640 | | RS1/16S472J |
| R 643 | | RS1/16S104J |
| R 644 | | RAB4C471J |
| R 646 | | RS1/16S102J |
| R 647 | | RS1/16S102J |
| R 649 | | RAB4C102J |
| R 650 | | RS1/16S102J |
| R 651 | | RAB4C103J |
| R 652 | | RS1/16S473J |
| R 653 | | RS1/16S102J |
| R 654 | | RS1/16S682J |
| R 655 | | RS1/16S333J |
| R 656 | | RS1/16S102J |
| R 657 | | RS1/16S102J |
| R 658 | | RS1/16S101J |
| R 660 | | RS1/16S473J |
| R 661 | | RS1/16S0R0J |
| R 662 | | RS1/16S102J |
| R 663 | | RS1/16S0R0J |
| R 666 | | RAB4C102J |
| R 669 | | RS1/16S473J |
| R 670 | | RS1/16S473J |
| R 671 | | RS1/16S473J |

| =====Circuit Symbol and No. | ===Part Name | Part No. |
|---|---|---|
| R 674 | | RS1/16S184J |
| R 675 | | RS1/16S103J |
| R 676 | | RS1/16S103J |
| R 677 | | RS1/16S222J |
| R 678 | | RS1/16S222J |
| R 697 | | RAB4C102J |
| R 698 | | RS1/16S473J |
| R 699 | | RS1/16S473J |
| R 700 | | RS1/16S223J |
| R 701 | | RS1/16S103J |
| R 702 | | RD1/4PU331J |
| R 703 | | RS1/16S103J |
| R 704 | | RS1/16S103J |
| R 706 | | RS1/16S473J |
| R 721 | | RS1/16S182J |
| R 722 | | RS1/16S182J |
| R 725 | | RS1/16S472J |
| R 750 | | RD1/4PU0R0J |
| R 801 | | RD1/4PU102J |
| R 807 | | RS1/16S472J |
| R 809 | | RD1/4PU331J |
| R 810 | | RS1/16S272J |
| R 811 | | RS1/16S103J |
| R 812 | | RS1/16S332J |
| R 813 | | RS1/16S132J |
| R 814 | | RD1/4PU271J |
| R 815 | | RS1/16S471J |
| R 816 | | RS1/16S222J |
| R 817 | | RD1/4PU102J |
| R 818 | | RS1/16S103J |
| R 819 | | RS1/16S105J |
| R 820 | | RS1/16S221J |
| R 821 | | RS1/16S222J |
| R 822 | | RS1/16S222J |
| R 823 | | RS1/16S221J |
| R 824 | | RS1/16S471J |
| R 825 | | RS1/16S105J |
| R 826 | | RS1/16S222J |
| R 827 | | RS1/16S331J |
| R 828 | | RS1/16S152J |
| R 829 | | RS1/16S331J |
| R 830 | | RS1/16S102J |
| R 831 | | RS1/16S822J |
| R 833 | | RD1/4PU1R8J |
| R 834 | | RS1/16S102J |
| R 835 | | RS1/16S0R0J |
| R 841 | | RS1/16S473J |
| R 842 | | RS1/16S473J |
| R 843 | | RS1/16S473J |
| R 844 | | RS1/16S473J |
| R 845 | | RS1/16S473J |
| R 846 | | RS1/16S473J |
| R 850 | | RS1/16S472J |
| R 851 | | RS1/16S472J |
| R 852 | | RD1/4PU102J |
| R 853 | | RS1/16S472J |
| R 854 | | RS1/16S102J |
| R 855 | | RS1/16S472J |
| R 870 | | RD1/4PU102J |
| R 871 | | RS1/16S0R0J |
| R 872 | | RS1/16S104J |
| R 873 | | RS1/16S472J |
| R 874 | | RS1/16S473J |
| R 875 | | RS1/16S473J |
| R 876 | | RS1/16S473J |
| R 877 | | RS1/16S473J |
| R 878 | | RS1/16S0R0J |
| R 879 | | RS1/16S472J |
| R 880 | | RS1/16S473J |
| R 883 | | RD1/4PU331J |

| =====Circuit Symbol and No. | ===Part Name | Part No. |
|---|---|---|
| R 891 | | RS1/16S152J |
| R 892 | | RS1/16S152J |
| R 893 | | RS1/16S0R0J |
| R 895 | | RS1/16S103J |
| R 896 | | RS1/16S103J |

## CAPACITORS

| | | |
|---|---|---|
| C 101 | | CKSRYB104K25 |
| C 102 | | CEJQ470M10 |
| C 103 | | CEJQ100M16 |
| C 104 | | CKSRYB104K25 |
| C 115 | | CKSRYB474K10 |
| C 116 | | CKSRYB474K10 |
| C 117 | | CKSRYB474K10 |
| C 118 | | CKSRYB474K10 |
| C 119 | | CKSRYB474K10 |
| C 120 | | CKSRYB474K10 |
| C 125 | | CKSRYB272K50 |
| C 126 | | CKSRYB272K50 |
| C 129 | | CKSRYB104K16 |
| C 130 | | CKSRYB104K16 |
| C 201 | | CEJQ330M10 |
| C 202 | | CEJQ010M50 |
| C 203 | | CFTLA105J50 |
| C 204 | | CEJQ100M16 |
| C 205 | | CKSRYF104Z25 |
| C 211 | | CFTNA224J50 |
| C 212 | | CFTNA224J50 |
| C 213 | | CFTNA224J50 |
| C 214 | | CFTNA224J50 |
| C 221 | | CKSRYB102K50 |
| C 222 | | CKSRYB102K50 |
| C 223 | | CKSRYB102K50 |
| C 224 | | CKSRYB102K50 |
| C 225 | | CKSRYB102K50 |
| C 226 | | CKSRYB102K50 |
| C 227 | | CKSRYB102K50 |
| C 228 | | CKSRYB102K50 |
| C 302 | | CKSRYB104K25 |
| C 303 | | CKSRYB104K25 |
| C 311 | | CEJQ100M16 |
| C 312 | | CEJQ100M16 |
| C 315 | | CEJQ100M16 |
| C 316 | | CEJQ100M16 |
| C 321 | | CKSRYB474K10 |
| C 322 | | CKSRYB474K10 |
| C 323 | | CKSRYB154K10 |
| C 324 | | CKSRYB154K10 |
| C 325 | | CKSRYB104K16 |
| C 326 | | CKSRYB104K16 |
| C 327 | | CKSRYB393K25 |
| C 328 | | CKSRYB393K25 |
| C 329 | | CKSRYB103K50 |
| C 330 | | CKSRYB103K50 |
| C 331 | | CKSRYB153K25 |
| C 332 | | CKSRYB153K25 |
| C 333 | | CKSRYB103K50 |
| C 334 | | CKSRYB103K50 |
| C 335 | | CKSRYB392K50 |
| C 336 | | CKSRYB392K50 |
| C 337 | | CCSRCH121J50 |
| C 338 | | CCSRCH121J50 |
| C 367 | | CKSRYB474K10 |
| C 368 | | CKSRYB474K10 |
| C 369 | | CKSRYB153K25 |
| C 370 | | CKSRYB153K25 |
| C 375 | | CCSRCH121J50 |
| C 376 | | CCSRCH121J50 |
| C 410 | | CKSQYB103K50 |
| C 411 | | CKSRYB103K50 |
| C 413 | | CKSRYB103K50 |
| C 414 | | CEJQ220M10 |

| =====Circuit Symbol and No. | | ===Part Name | Part No. |
|---|---|---|---|
| C | 417 | | CEJQ101M6R3 |
| C | 418 | | CKSRYB103K50 |
| C | 419 | | CKSRYB183K50 |
| C | 420 | | CKSRYB183K50 |
| C | 421 | | CKSRYB472K50 |
| C | 423 | | CKSRYB682K50 |
| C | 424 | | CKSRYB392K50 |
| C | 601 | | CCSRCH220J50 |
| C | 602 | | CCSRCH180J50 |
| C | 603 | | CEJQ100M16 |
| C | 604 | | CCSRCH101J50 |
| C | 607 | | CCSRCH220J50 |
| C | 608 | | CCSRCH220J50 |
| C | 630 | | CKSRYB102K50 |
| C | 658 | | CKSRYB104K25 |
| C | 661 | | CKSRYB681K50 |
| C | 662 | | CKSRYB681K50 |
| C | 692 | | CKSRYB104K25 |
| C | 700 | | CKSRYB102K50 |
| C | 701 | | CKSRYB473K50 |
| C | 702 | | CEJQ101M10 |
| C | 705 | | CEJQ100M16 |
| C | 706 | | CEJQ100M16 |
| C | 707 | | CEAT471M10 |
| C | 730 | | CEJQ101M10 |
| C | 731 | | CEJQ101M16 |
| C | 801 | 4700µF/16V | HCH0015 |
| C | 803 | | CKSRYB223K50 |
| C | 804 | | CEJQ100M16 |
| C | 805 | | CKSRYB102K50 |
| C | 807 | | CEJQ220M10 |
| C | 808 | | CKSRYB473K50 |
| C | 809 | 1000µF/16V | CCH1149 |
| C | 810 | | CKSRYB103K50 |
| C | 820 | | CEJQ101M10 |
| C | 821 | | CKSRYB472K50 |
| C | 822 | | CKSRYB223K50 |
| C | 823 | | CEJQ100M16 |
| C | 824 | | CKSRYB102K50 |
| C | 830 | | CEJQ2R2M50 |
| C | 850 | | CKSRYB221K50 |
| C | 851 | | CKSRYB102K50 |
| C | 870 | | CCSRCH181J50 |
| C | 871 | | CKSRYB102K50 |
| C | 872 | | CKSRYB102K50 |
| C | 873 | | CKSRYB473K50 |
| C | 880 | | CKSRYB472K50 |

## B Unit Number : HWM0085
## Unit Name : Keyboard Unit

### MISCELLANEOUS

| | | | |
|---|---|---|---|
| IC | 901 | IC | LC75813E |
| Q | 901 | Transistor | DTC114EU |
| Q | 902 | Transistor | DTC114EU |
| Q | 903 | Transistor | DTC114EU |
| Q | 904 | Transistor | DTC114EU |
| Q | 906 | Transistor | DTA114EU |
| D | 911 | LED | SML-310PT(KL) |
| D | 912 | LED | SML-310PT(KL) |
| D | 913 | LED | SML-310PT(KL) |
| D | 914 | LED | SML-310PT(KL) |
| D | 915 | LED | SML-310PT(KL) |
| D | 916 | LED | SML-310PT(KL) |
| D | 917 | LED | SML-310PT(KL) |
| D | 918 | LED | SML-310PT(KL) |
| D | 919 | LED | SML-310PT(KL) |

| =====Circuit Symbol and No. | | ===Part Name | Part No. |
|---|---|---|---|
| D | 920 | LED | SML-310PT(KL) |
| D | 921 | LED | SML-310PT(KL) |
| D | 922 | LED | SML-310PT(KL) |
| D | 923 | LED | SML-310PT(KL) |
| D | 924 | LED | SML-310PT(KL) |
| D | 925 | LED | SML-310PT(KL) |
| D | 926 | LED | SML-310PT(KL) |
| D | 927 | LED | SML-310PT(KL) |
| D | 928 | LED | SML-310PT(KL) |
| D | 929 | LED | SML-310PT(KL) |
| D | 930 | LED | SML-310PT(KL) |
| D | 931 | LED | SML-310PT(KL) |
| D | 932 | LED | SML-310PT(KL) |
| D | 933 | LED | SML-310PT(KL) |
| D | 934 | LED | SML-310PT(KL) |
| D | 935 | LED | SML-310PT(KL) |
| D | 936 | LED | SML-310PT(KL) |
| D | 937 | LED | SML-310PT(KL) |
| D | 938 | LED | SML-310PT(KL) |
| D | 939 | LED | SML-310PT(KL) |
| D | 940 | LED | SML-310PT(KL) |
| D | 941 | LED | SML-310PT(KL) |
| D | 942 | LED | SML-310PT(KL) |
| D | 943 | Chip LED | SML010PT(KL) |
| D | 944 | Chip LED | SML010PT(KL) |
| D | 945 | LED | SML-310PT(KL) |
| D | 946 | LED | SML-310PT(KL) |
| D | 947 | LED | SML-310PT(KL) |
| D | 948 | LED | SML-310PT(KL) |
| D | 949 | LED | SML-310PT(KL) |
| D | 950 | LED | SML-310PT(KL) |
| D | 951 | Diode | DAN202U |
| D | 952 | Diode | DAN202U |
| D | 953 | Diode | 1SS355 |
| D | 954 | Diode | 1SS355 |
| D | 955 | Diode | 1SS355 |
| D | 956 | Diode | 1SS355 |
| D | 959 | LED | SML-310PT(KL) |
| D | 960 | LED | SML-310PT(KL) |
| D | 961 | Chip LED | SML010PT(KL) |
| D | 962 | Chip LED | SML010PT(KL) |
| L | 900 | Inductor | LCTB2R2K1608 |
| IL | 901 | Lamp 8V 105mA | CEL1747 |
| IL | 902 | Lamp 8V 105mA | CEL1747 |
| VR | 901 | Encoder (VOLUME/POWER) | CSD1073 |
| LCD | 904 | LCD | CAW1822 |

### RESISTORS

| | | | |
|---|---|---|---|
| R | 901 | | RS1/16S473J |
| R | 902 | | RS1/16S472J |
| R | 903 | | RS1/16S472J |
| R | 904 | | RS1/16S472J |
| R | 905 | | RS1/16S471J |
| R | 906 | | RS1/16S471J |
| R | 907 | | RS1/16S471J |
| R | 908 | | RS1/16S471J |
| R | 921 | | RS1/16S181J |
| R | 922 | | RS1/16S181J |
| R | 923 | | RS1/16S181J |
| R | 924 | | RS1/16S181J |
| R | 925 | | RS1/16S181J |
| R | 926 | | RS1/16S181J |
| R | 927 | | RS1/16S181J |
| R | 928 | | RS1/16S181J |
| R | 929 | | RS1/16S181J |
| R | 930 | | RS1/16S181J |
| R | 931 | | RS1/16S181J |
| R | 932 | | RS1/16S181J |

| Circuit Symbol and No. | | Part Name | Part No. |
|---|---|---|---|
| R | 933 | | RS1/16S181J |
| R | 934 | | RS1/16S181J |
| R | 935 | | RS1/16S181J |
| R | 936 | | RS1/16S181J |
| R | 937 | | RS1/16S181J |
| R | 938 | | RS1/16S181J |
| R | 939 | | RS1/16S181J |
| R | 940 | | RS1/16S181J |
| R | 941 | | RS1/16S181J |
| R | 942 | | RS1/16S181J |
| R | 943 | | RS1/16S181J |
| R | 944 | | RS1/16S181J |
| R | 945 | | RS1/16S181J |
| R | 946 | | RS1/16S181J |
| R | 947 | | RS1/16S181J |
| R | 948 | | RS1/16S181J |
| R | 949 | | RS1/16S181J |
| R | 950 | | RS1/16S181J |
| R | 951 | | RS1/16S181J |
| R | 952 | | RS1/16S181J |
| R | 953 | | RS1/16S151J |
| R | 954 | | RS1/16S151J |
| R | 955 | | RS1/16S181J |
| R | 956 | | RS1/16S181J |
| R | 957 | | RS1/16S181J |
| R | 958 | | RS1/16S181J |
| R | 959 | | RS1/16S181J |
| R | 960 | | RS1/16S181J |
| R | 961 | | RS1/16S181J |
| R | 962 | | RS1/16S181J |
| R | 963 | | RS1/16S151J |
| R | 964 | | RS1/16S151J |

CAPACITORS

| | | | |
|---|---|---|---|
| C | 901 | | CKSRYB104K25 |
| C | 902 | | CKSRYB681K50 |
| C | 903 | | CKSRYB104K25 |
| C | 904 | | CKSRYB104K25 |
| C | 905 | | CKSRYB104K25 |

## D Unit Number : EWM1031
## Unit Name : Deck Unit

MISCELLANEOUS

| | | | |
|---|---|---|---|
| IC | 251 | IC | HA12216F |
| IC | 351 | IC | PA2020A |
| Q | 271 | Transistor | 2SC4116 |
| D | 352 | Diode | 1SS355 |
| VR | 301 | Semi-fixed 33kΩ(B) | CCP1280 |
| VR | 302 | Semi-fixed 33kΩ(B) | CCP1280 |

RESISTORS

| | | | |
|---|---|---|---|
| R | 255 | | RS1/16S181J |
| R | 256 | | RS1/16S181J |
| R | 257 | | RS1/16S183J |
| R | 258 | | RS1/16S183J |
| R | 259 | | RS1/16S133J |
| R | 260 | | RS1/16S133J |
| R | 261 | | RS1/16S274J |
| R | 262 | | RS1/16S274J |
| R | 271 | | RS1/16S183J |
| R | 272 | | RS1/8S0R0J |
| R | 273 | | RS1/8S0R0J |
| R | 274 | | RS1/16S0R0J |
| R | 275 | | RS1/16S473J |
| R | 276 | | RS1/16S104J |
| R | 277 | | RS1/16S224J |

| Circuit Symbol and No. | | Part Name | Part No. |
|---|---|---|---|
| R | 278 | | RS1/16S104J |
| R | 281 | | RS1/8S0R0J |
| R | 282 | | RS1/8S0R0J |
| R | 283 | | RS1/8S0R0J |
| R | 284 | | RS1/8S0R0J |
| R | 285 | | RS1/16S0R0J |
| R | 287 | | RS1/16S0R0J |
| R | 291 | | RS1/8S0R0J |
| R | 292 | | RS1/10S0R0J |
| R | 293 | | RS1/10S0R0J |
| R | 294 | | RS1/10S0R0J |
| R | 321 | | RS1/8S0R0J |
| R | 322 | | RS1/8S0R0J |
| R | 351 | | RS1/16S102J |
| R | 352 | | RS1/16S102J |
| R | 353 | | RS1/16S102J |
| R | 354 | | RS1/16S102J |
| R | 355 | | RS1/16S274J |
| R | 362 | | RS1/8S301J |
| R | 373 | | RS1/16S0R0J |
| R | 374 | | RS1/8S0R0J |
| R | 375 | | RS1/8S0R0J |
| R | 401 | | RS1/16S153J |
| R | 402 | | RS1/16S332J |
| R | 403 | | RS1/16S911J |
| R | 404 | | RS1/16S274J |

CAPACITORS

| | | | |
|---|---|---|---|
| C | 251 | | CKSRYB391K50 |
| C | 252 | | CKSRYB391K50 |
| C | 253 | | CKSRYB391K50 |
| C | 254 | | CKSRYB391K50 |
| C | 255 | | CKSRYB103K50 |
| C | 256 | | CKSRYB103K50 |
| C | 271 | 1μF/50V | ECH0002 |
| C | 272 | | CKSRYB104K16 |
| C | 301 | | CKSRYB104K16 |
| C | 302 | | CKSRYB104K16 |
| C | 309 | | CKSRYB104K16 |
| C | 310 | | CKSRYB104K16 |
| C | 351 | | CKSQYB224K25 |
| C | 352 | | CKSRYB392K50 |
| C | 353 | | CKSRYB103K50 |
| C | 354 | | CKSRYB103K50 |
| C | 355 | | CKSQYB104K50 |
| C | 356 | | CKSRYB103K50 |
| C | 401 | | CKSRYB392K50 |
| C | 402 | | CKSRYB334K10 |
| C | 403 | | CKSRYB223K25 |
| C | 404 | | CKSRYB103K50 |
| C | 405 | | CKSRYB333K16 |

## E Unit Number : EWM1036
## Unit Name : Sensor Unit

| | | | |
|---|---|---|---|
| Q | 101 | Photo-reflector | EGN1004 |
| S | 101 | Switch(LOAD) | ESG1007 |
| S | 102 | Switch(MODE) | ESG1007 |
| S | 103 | Switch(70μS) | ESG1007 |

## C Unit Number : CWX2687
## Unit Name : CD Core Unit(S9MP3)

MISCELLANEOUS

| | | | |
|---|---|---|---|
| IC | 201 | IC | UPD63760GJ |
| IC | 202 | IC | MSM51V4265EP-70TS |
| IC | 203 | IC | BA033SFP |
| IC | 301 | IC | BA5996FM |
| IC | 701 | IC | PE5317B |

| =====Circuit Symbol and No. | | ===Part Name | Part No. |
|---|---|---|---|
| IC | 702 | IC | TC74VHCT08AFT |
| IC | 703 | IC | S-818A33AUC-BGN |
| Q | 101 | Transistor | 2SB1132 |
| Q | 601 | Transistor | DTC323TK |
| Q | 602 | Transistor | DTC323TK |
| Q | 603 | Transistor | 2SB709A |
| Q | 701 | Transistor | UN2111 |
| D | 101 | Diode | 1SS355 |
| D | 201 | Diode | 1SR154-400 |
| D | 202 | Diode | 1SR154-400 |
| D | 203 | Diode | 1SR154-400 |
| D | 601 | Chip Diode | MA151WA |
| L | 201 | Inductor | CTF1386 |
| L | 202 | Inductor | CTF1386 |
| L | 204 | Inductor | CTF1386 |
| L | 205 | Inductor | CTF1386 |
| L | 206 | Inductor | CTF1386 |
| L | 207 | Inductor | CTF1386 |
| L | 208 | Inductor | CTF1386 |
| L | 701 | Inductor | CTF1386 |
| L | 702 | Inductor | LCYBR22J1608 |
| L | 703 | Inductor | CTF1386 |
| TH | 701 | Thermistor | CCX1037 |
| X | 201 | Ceramic Resonator 16.930MHz | CSS1569 |
| X | 202 | Ceramic Resonator 24.57MHz | CSS1570 |
| X | 701 | Ceramic Resonator 16.000MHz | CSS1576 |
| S | 901 | Switch(HOME) | CSN1051 |
| S | 902 | Spring Switch(CLAMP) | CSN1052 |
| S | 903 | Switch(DSCSNS) | CSN1051 |
| S | 904 | Spring Switch(12EJ) | CSN1052 |
| S | 905 | Switch(8EJ) | CSN1051 |
| EF | 201 | Emi Filter | CCG1051 |

## RESISTORS

| | | |
|---|---|---|
| R | 101 | RS1/10S1R5J |
| R | 102 | RS1/10S1R5J |
| R | 103 | RS1/10S1R5J |
| R | 104 | RS1/10S1R5J |
| R | 105 | RS1/10S1R5J |
| R | 201 | RS1/16SS102J |
| R | 202 | RS1/16SS333J |
| R | 203 | RS1/16SS333J |
| R | 204 | RS1/16SS333J |
| R | 205 | RS1/16SS0R0J |
| R | 207 | RS1/16SS0R0J |
| R | 209 | RS1/16SS0R0J |
| R | 212 | RS1/16SS221J |
| R | 213 | RS1/16SS1002D |
| R | 214 | RS1/16SS1002D |
| R | 215 | RS1/16SS1002D |
| R | 216 | RS1/16SS1002D |
| R | 217 | RS1/16SS1002D |
| R | 218 | RS1/16SS1002D |
| R | 219 | RS1/16SS1002D |
| R | 220 | RS1/16SS1002D |
| R | 221 | RS1/16SS103J |
| R | 222 | RS1/16SS103J |
| R | 223 | RS1/16SS103J |
| R | 224 | RS1/16SS103J |
| R | 225 | RS1/16SS103J |
| R | 226 | RS1/16SS393J |
| R | 227 | RS1/16SS103J |
| R | 228 | RS1/16SS182J |
| R | 229 | RS1/16SS103J |
| R | 233 | RS1/16SS183J |
| R | 237 | RS1/16SS104J |
| R | 238 | RS1/16SS473J |
| R | 301 | RS1/16SS183J |
| R | 302 | RS1/16SS822J |

| =====Circuit Symbol and No. | | ===Part Name | Part No. |
|---|---|---|---|
| R | 303 | | RS1/16SS0R0J |
| R | 304 | | RS1/16SS183J |
| R | 305 | | RS1/16SS822J |
| R | 306 | | RS1/16SS0R0J |
| R | 307 | | RS1/16SS183J |
| R | 308 | | RS1/16SS822J |
| R | 309 | | RS1/16SS183J |
| R | 310 | | RS1/16SS822J |
| R | 311 | | RS1/16SS0R0J |
| R | 601 | | RS1/16S101J |
| R | 602 | | RS1/16S101J |
| R | 603 | | RS1/16S223J |
| R | 604 | | RS1/16S223J |
| R | 605 | | RS1/16SS103J |
| R | 701 | | RS1/16SS0R0J |
| R | 707 | | RS1/16SS0R0J |
| R | 708 | | RS1/16SS102J |
| R | 709 | | RS1/16SS102J |
| R | 710 | | RS1/16SS102J |
| R | 711 | | RS1/16SS102J |
| R | 712 | | RS1/16SS102J |
| R | 713 | | RS1/16SS102J |
| R | 714 | | RS1/16SS473J |
| R | 715 | | RAB4CQ221J |
| R | 716 | | RAB4CQ221J |
| R | 717 | | RAB4CQ221J |
| R | 718 | | RAB4CQ221J |
| R | 719 | | RS1/16SS221J |
| R | 720 | | RS1/16SS471J |
| R | 723 | | RS1/16SS102J |
| R | 724 | | RN1/16SE1302D |
| R | 725 | | RS1/16SS222J |
| R | 726 | | RS1/16SS103J |
| R | 727 | | RS1/16SS473J |
| R | 728 | | RS1/16SS473J |
| R | 729 | | RS1/16SS223J |
| R | 730 | | RS1/16SS473J |
| R | 731 | | RS1/16SS104J |
| R | 732 | | RS1/16SS104J |
| R | 733 | | RS1/16SS104J |
| R | 737 | | RAB4CQ473J |
| R | 739 | | RAB4CQ473J |
| R | 740 | | RS1/16SS473J |
| R | 742 | | RS1/16SS104J |
| R | 744 | | RS1/16SS104J |
| R | 745 | | RS1/16SS473J |
| R | 746 | | RS1/16SS104J |
| R | 747 | | RS1/16SS104J |
| R | 748 | | RS1/16SS104J |
| R | 801 | | RS1/16SS104J |
| R | 802 | | RS1/16SS473J |
| R | 803 | | RS1/16SS273J |
| R | 901 | | RS1/16SS221J |
| R | 902 | | RS1/16SS221J |
| R | 903 | | RS1/16SS221J |
| R | 904 | | RS1/16SS221J |
| R | 905 | | RS1/16SS221J |
| R | 906 | | RS1/16SS221J |

## CAPACITORS

| | | |
|---|---|---|
| C | 101 | CKSSYB104K10 |
| C | 102 | CKSSYB104K10 |
| C | 103 | CEV101M16 |
| C | 104 | CEV101M4 |
| C | 105 | CKSSYB104K10 |
| C | 106 | CKSRYB102K50 |
| C | 108 | CKSSYB104K10 |
| C | 109 | CEV100M16 |
| C | 201 | CKSSYB471K50 |
| C | 202 | CKSSYB104K10 |

| | | | =====Circuit Symbol and No.===Part Name | Part No. |
|---|---|---|---|---|
| | C | 203 | | CKSSYB104K10 |
| A | C | 204 | | CEV220M6R3 |
| | C | 205 | | CKSSYB103K16 |
| | C | 206 | | CKSSYB103K16 |
| | C | 207 | | CEV221M4 |
| | C | 208 | | CKSSYB104K10 |
| | C | 209 | | CKSSYB104K10 |
| | C | 210 | | CKSSYB104K10 |
| ■ | C | 211 | | CKSSYB104K10 |
| | C | 216 | | CKSSYB332K50 |
| | C | 217 | | CKSSYB104K10 |
| | C | 218 | | CKSSYB223K16 |
| | C | 219 | | CKSSYB104K10 |
| | C | 220 | | CKSSYB103K16 |
| | C | 221 | | CKSSYB104K10 |
| B | | | | |
| | C | 222 | | CCSSCH270J50 |
| | C | 223 | | CCSSCJ3R0C50 |
| | C | 224 | | CKSSYB104K10 |
| | C | 225 | | CKSSYB103K16 |
| | C | 226 | | CCSSCH680J50 |
| | C | 227 | | CCSSCH470J50 |
| ■ | C | 228 | | CKSSYB682K25 |
| | C | 230 | | CKSSYB104K10 |
| | C | 232 | | CKSSYB104K10 |
| | C | 233 | 47µF/6.3V | CCH1436 |
| | C | 234 | | CEV221M4 |
| | C | 235 | | CKSRYB224K16 |
| | C | 237 | | CKSSYB104K10 |
| C | C | 238 | | CKSSYB104K10 |
| | C | 240 | | CKSSYB104K10 |
| | C | 242 | | CKSSYB104K10 |
| | C | 301 | | CKSSYB331K50 |
| | C | 302 | | CKSSYB331K50 |
| | C | 303 | | CKSSYB472K25 |
| | C | 304 | | CKSSYB472K25 |
| ■ | | | | |
| | C | 305 | | CEV101M16 |
| | C | 306 | | CKSRYB224K16 |
| | C | 601 | | CKSRYB102K50 |
| | C | 602 | | CKSRYB102K50 |
| | C | 603 | | CSZS4R7M10 |
| | C | 604 | | CSZS4R7M10 |
| D | C | 701 | | CKSSYB104K10 |
| | C | 702 | | CKSSYB471K50 |
| | C | 703 | | CKSSYB103K16 |
| | C | 704 | | CEV1R0M50 |
| | C | 705 | | CKSSYB104K10 |
| | C | 707 | | CKSSYB104K10 |
| | C | 708 | | CKSSYB104K10 |
| ■ | C | 709 | | CKSSYB103K16 |
| | C | 710 | | CKSSYB104K10 |
| | C | 711 | 10µF/10V | CCH1349 |
| | C | 712 | | CKSRYB224K16 |
| | C | 713 | | CKSSYB104K10 |
| | C | 714 | | CKSSYB104K10 |
| | C | 715 | | CKSSYB103K16 |
| E | | | | |
| | C | 716 | | CKSSYB103K16 |
| | C | 901 | | CKSSYB104K10 |
| | C | 903 | | CCSRCH101J50 |

## Miscellaneous Parts List

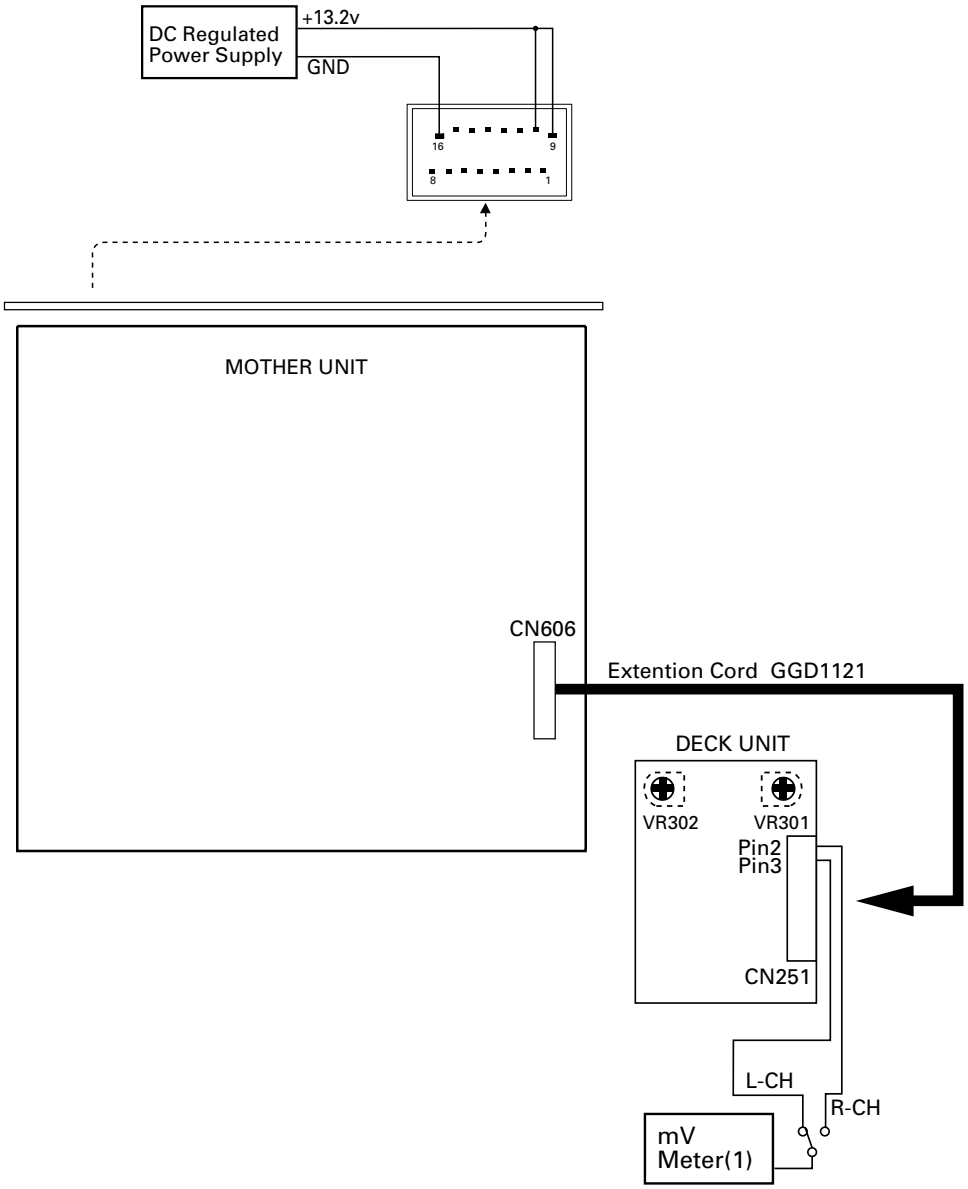
| | | | |
|---|---|---|---|
| | | Pickup Unit(Service)(P9MP3) | CXX1551 |
| ■ M | 1 | Motor Unit(SPINDLE) | CXB6007 |
| M | 2 | Motor Unit(LOADING/CARRIAGE) | CXB5903 |
| M | 1 | Motor Unit(MAIN) | EXA1491 |
| M | 2 | Motor Unit(SUB) | EXA1623 |
| HD | 1 | Head Assy | EXA1594 |

F

# 6. ADJUSTMENT

## 6.1 DOLBY B NR ADJUSTMENT

● **Connection Diagram**




**DOLBY B NR ADJUSTMENT**

| No. | Test Tape | Adjustment Point | Adjustment Method (Switch Position) |
|---|---|---|---|
| 1 | NCT-150 (400Hz,200nWb/m) | VR301(Lch),VR302(Rch) | mV Meter(1) : –8.24dBm(300mV)±1dB (DOLBY NR Switch : OFF) |

## 6.2 CD ADJUSTMENT

1) Precautions

- This unit uses a single power supply (+3.3V) for the regulator. The signal reference potential, therefore, is connected to REFO1(approx. 1.65V) instead of GND.
  If REFO1 and GND are connected to each other by mistake during adjustments, not only will it be impossible to measure the potential correctly, but the servo will malfunction and a severe shock will be applied to the pick-up. To avoid this, take special note of the following.
  Do not connect the negative probe of the measuring equipment to REFO1 and GND together. It is especially important not to connect the channel 1 negative probe of the oscilloscope to REFO1 with the channel 2 negative probe connected to GND.
  Since the frame of the measuring instrument is usually at the same potential as the negative probe, change the frame of the measuring instrument to floating status.
  If by accident REFO1 comes in contact with GND, immediately switch the regulator or power OFF.

- Always make sure the regulator is OFF when connecting and disconnecting the various filters and wiring required for measurements.

- Before proceeding to further adjustments and measurements after switching regulator ON, let the player run for about one minute to allow the circuits to stabilize.

- Since the protective systems in the unit's software are rendered inoperative in test mode, be very careful to avoid mechanical and /or electrical shocks to the system when making adjustment.

- The RFI and RFO signals are easy to oscillate because of a wide band. When observing them, insert a resistor of about 1 kΩ to the series.

- This equipment will not guarantee the load ejection operation when the mechanical unit is turned upside down. In particular, if the ejection operation is incorrectly performed and recovery is disabled, the recovery is enabled by resetting a product or turning ACC off to on.

2) Test Mode

This mode is used for adjusting the CD mechanism module of the device.

- Test mode starting procedure
  Reset while pressing the **4** and **6** keys together.

- Test mode cancellation
  Switch ACC, back-up OFF.

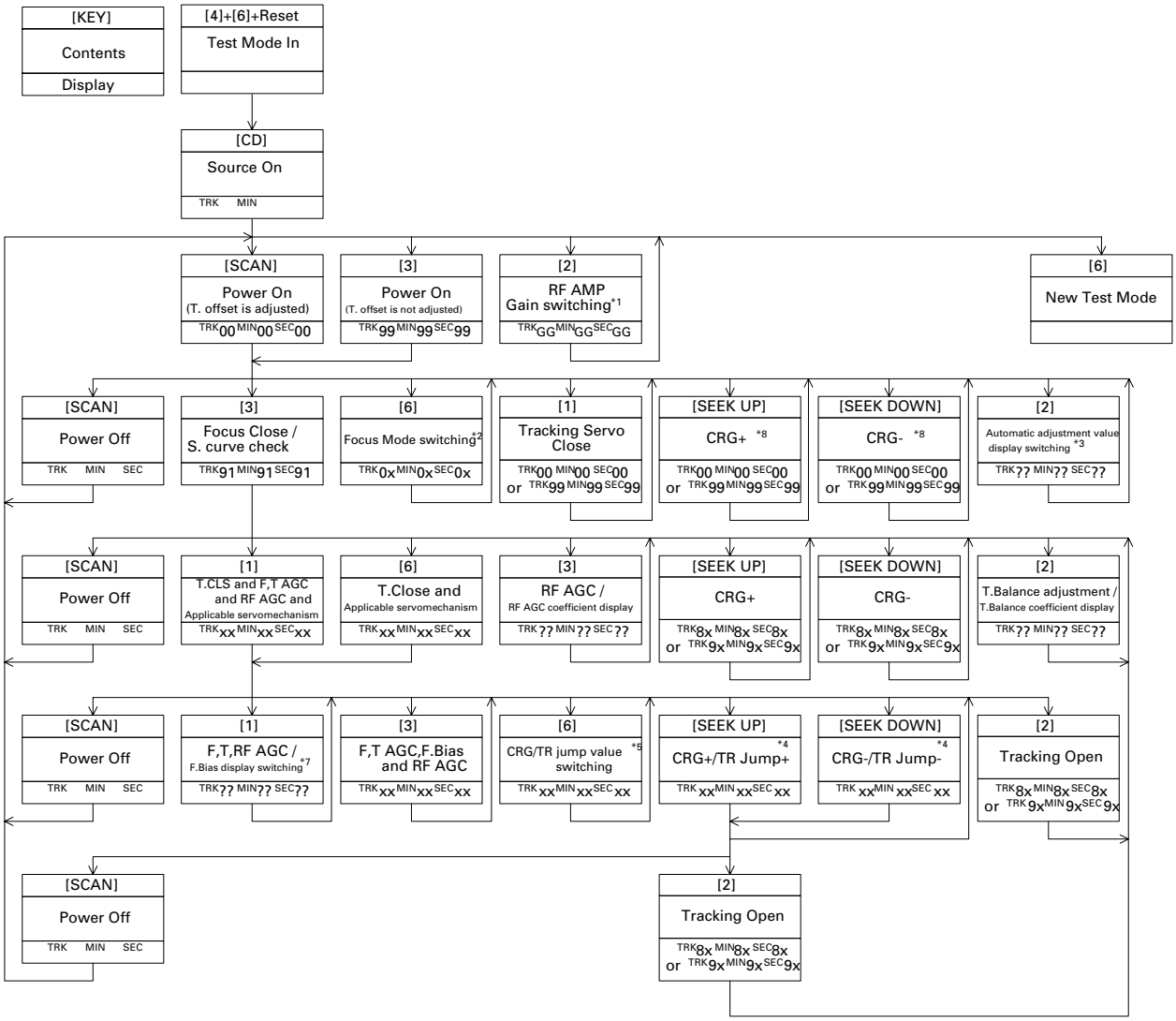
- After pressing the EJECT key, do not press any other key until the disk is completely ejected.

- If the **SEEK UP** or **SEEK DOWN** key is pressed while focus search is in progress, immediately turn the power off (otherwise the actuator may be damaged due to adhesion of the lenses).

- Jump operation of TRs other than 100TR continues after releasing the key. CRG move and 100TR jump operations are brought into the “Tracking close” status when the key is released.

- Powering Off/On resets the jump mode to “Single TR(91)”, the RF AMP gain setting to 0 dB, and the automatic adjustment value to the initial value.

## ● Flow Chart




*1) TYP (TRK MIN SEC) → +12dB (TRK12 MIN12 SEC12)

*2) Focus Close setting (TRK00 MIN00 SEC00 or TRK99 MIN99 SEC99) → S. curve check setting (TRK01 MIN01 SEC01) → F. EQ measurement setting (TRK02 MIN02 SEC02)

*3) F.Offset Display → T.Offset Display → Switch to the order of the original display

*4) 1TR/32TR/100TR

*5 Single TR (TRK91 MIN91 SEC91 or TRK81 MIN81 SEC81) → 32TR (TRK92 MIN92 SEC92 or TRK82 MIN82 SEC82) → 100TR (TRK93 MIN93 SEC93 or TRK83 MIN83 SEC83) → CRG Move (TRK94 MIN94 SEC94 or TRK84 MIN84 SEC84)

*6) Only at the time of CRG move or 100TR jump

*7) TRK/MIN/SEC → F.AGC Gain → T.AGC Gain → F.Bias → RF AGC Gain

*8) CRG motor voltage = 2 [V]

| [Key] | Operation | |
|---|---|---|
| | Test Mode | New Test Mode |
| [SCAN] | Power On/Off | Error occurrence time/ cause display switching |
| [SEEK UP] | CRG +/TR Jump+ (Direction of the external surface) | TRK+/FF |
| [SEEK DOWN] | CRG -/TR Jump- (Direction of the internal surface) | TRK-/REV |
| [1] | T.CLS and AGC and Applicable servomechanism/ AGC,AGC display switching | SCAN |
| [2] | RF Gain switching/Offset adjustment display/ T.Balance adjustment/T.OPN | MODE |
| [3] | F.CLS,S.Curve/Rough Servo and RF AGC/ F,T,RF AGC | (ITP) |
| - | SPDL 1X/2X switching (Double-speed compatibility only) | - |
| - | Error rate measurement | - |
| [6] | F.Mode switching/T.CLS/CRG,TR Jump switching | Auto/Manual switching |

## 6.3 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT

• **Note :**
The grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

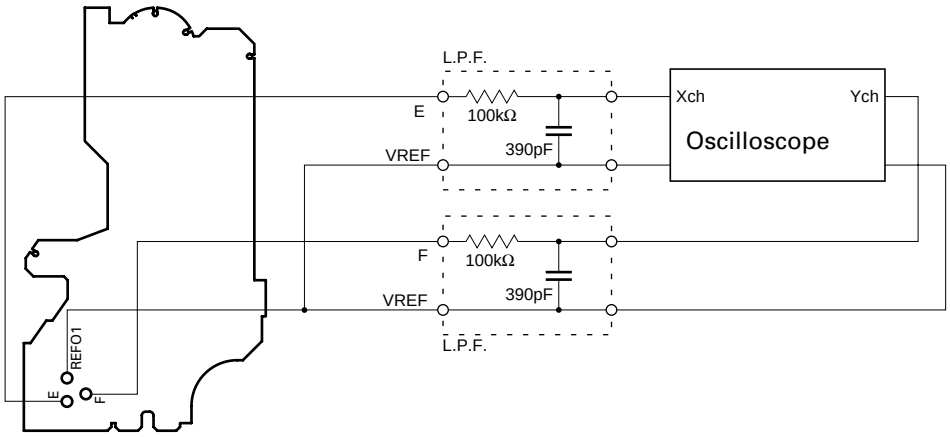
• **Purpose :**
To check that the grating is within an acceptable range when the PU unit is changed.

• **Symptoms of Mal-adjustment :**
If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or taking a long time for track searching.

• **Method :**

| | |
|---|---|
| • Measuring Equipment | • Oscilloscope, Two L.P.F. |
| • Measuring Points | • E, F, REFO1 |
| • Disc | • ABEX TCD-782 |
| • Mode | • TEST MODE |

CD CORE UNIT(S9MP3)




• **Checking Procedure**
1. In test mode, load the disc and switch the 5V regulator on.
2. Using the **SEEK UP** and **SEEK DOWN** buttons, move the PU unit to the innermost track.
3. Press key **3** to close focus, the display should read "91". Press key **2** to implement the tracking balance adjustment the display should now read "81". Press key **3**. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75° . Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75° try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75° then the mechanism should be judged to be at fault.

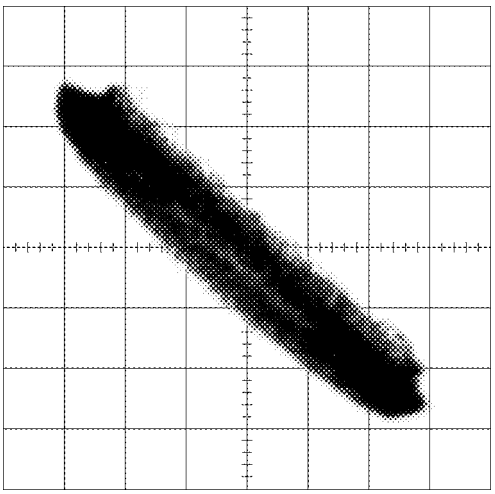
• **Note**
Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" ( the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

• **Hint**
Reloading the disc changes the clamp position and may decrease the "wobble".

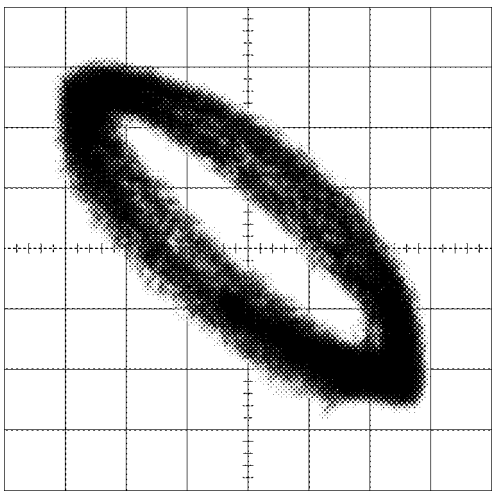
**Grating waveform**

Ech → Xch 20mV/div, AC
Fch → Ych 20mV/div, AC

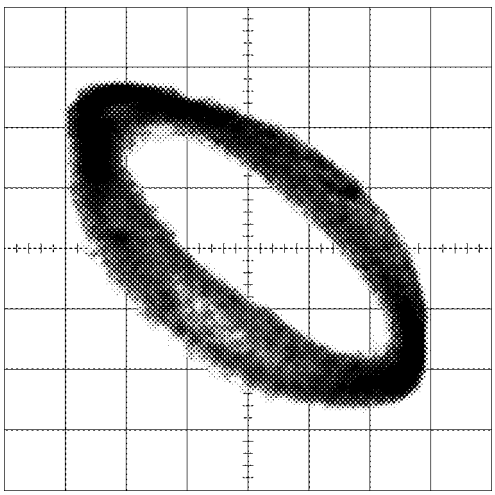
0°



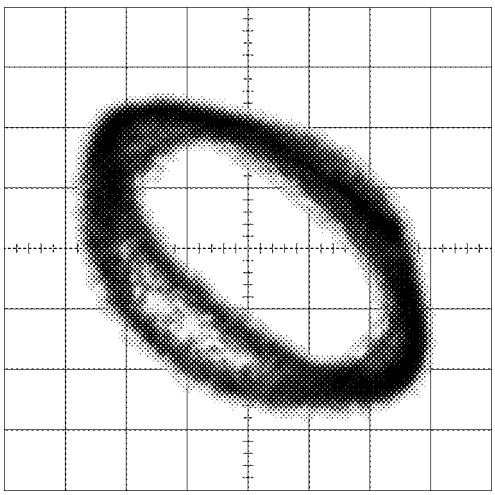
30°



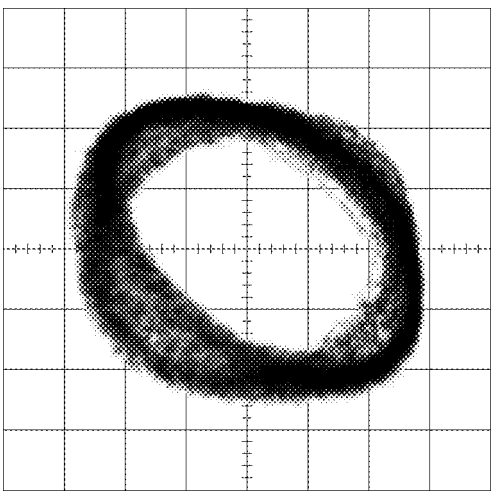
45°



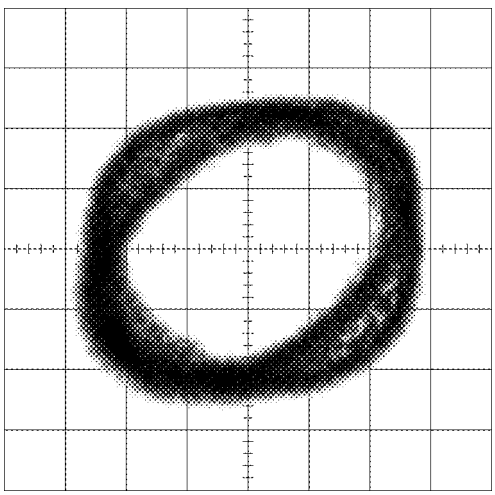
60°



75°



90°



# 6.4 CD TEST MODE

## ● Error Messages

If a CD is not operative or stopped during operation due to an error, the error mode is turned on and cause(s) of the error is indicated with a corresponding number. This arrangement is intended at reducing nonsense calls from the users and also for facilitating trouble analysis and repair work in servicing.

(1) Basic Indication Method

1) When SERRORM is selected for the CSMOD (CD mode area for the system), error codes are written to DMIN (minutes display area) and DSEC (seconds display area). The same data is written to DMIN and DSEC. DTNO remains in blank as before.

2) Head unit display examples

Depending on display capability of LCD used, display will vary as shown below. xx contains the error number.

| 8-digit display | 6-digit display | 4-digit display |
|---|---|---|
| ERROR–xx | ERR–xx | E–xx |

(2) Error Code List

| Code | Class | Displayed error code | Description of the code and potential cause(s) |
|---|---|---|---|
| 10 | Electricity | Carriage Home NG<br>SERVO LSI Communication Error | CRG can't be moved to inner diameter.<br>CRG can't be moved from inner diameter.<br>→ Failure on home switch or CRG move mechanism.<br>Communication error between microcomputer and SERVO LSI. |
| 11 | Electricity | Focus Servo NG | Focusing not available.<br>→ Stains on rear side of disc or excessive vibrations on REWRITABLE. |
| 12 | Electricity | Spindle Lock NG<br>Subcode NG | Spindle not locked. Sub-code is strange (not readable).<br>→ Failure on spindle, stains or damages on disc, or excessive vibrations.<br>A disc not containing CD-R data is found.<br>Turned over disc are found, though rarely.<br>CD signal error. |
| 17 | Electricity | Setup NG | AGC protection doesn't work. Focus can be easily lost.<br>→ Damages or stains on disc, or excessive vibrations on REWRITABLE. |
| 30 | Electricity | Search Time Out | Failed to reach target address.<br>→ CRG tracking error or damages on disc. |
| 44 | Electricity | ALL Skip | Skip setting for all track.<br>(CD-R/RW) |
| 50 | Mechanism | CD On Mech Error | Mechanical error during CD ON.<br>→ Defective loading motor, mechanical lock and mechanical sensor. |
| A0 | System | Power Supply NG | Power (VD) is ground faulted.<br>→ Failure on SW transistor or power supply (failure on connector). |

Remarks: Mechanical errors are not displayed (because a CD is turned off in these errors).

Unreadable TOC does not constitute an error. An intended operation continues in this case.

Upper digits of an error code are subdivided as shown below:

1x: Setup relevant errors, 3x: Search relevant errors, Ax: Other errors.

## ● New Test Mode

S-CD plays the same way as before.

If an error such as off focus, spindle unlocking, unreadable sub-code, or sound skipping occurs after setup, its cause and time occurred (in absolute time) are displayed.

During setup, operational status of the control software is displayed.

These displays and functions are prepared for enhancing aging in the servicing and efficiency of trouble analysis.

(1) Shifting to the New Test Mode

① Turn on the current test mode by starting the reset from the key.

② Select S-CD for the source through the specified procedure including use of the [CD] key, and inserting the disc. Then, press the [Jump Mode Selector] key while maintaining the regulator turned off.

③ After the above operations, the new test mode remains on irrespective of whether the S-CD is turned on or off. You can reset the new test mode by turning on the reset start.

(2) Key Correspondence

| Key | Test mode | | New test mode | |
|---|---|---|---|---|
| | Regulator Off | Regulator On | In-play | Error Production |
| SCAN | To regulator on | To regulator off | – | Time/Err.No. switching |
| SEEK UP | – | FWD-Kick | FF/TR+ | – |
| SEEK DOWN | – | REV-Kick | REV/TR- | – |
| 1 | – | Tracking Close | Scan | – |
| 2 | – | Tracking Open | Mode | – |
| 3 | – | Focus Close | – | – |
| – | – | Focus Open | – | – |
| – | – | Jump Off | – | – |
| 6 | To new test mode | Jump mode switching | Auto/Manu | – |

Note: Eject and CD on/off is performed in the same procedure as that for the normal mode.

(3) Cause of Error and Error Code

| Code | Class | Contents | Description and cause |
|---|---|---|---|
| 40 | Electricity | Off focus detected. | FOK goes low.<br>→ Damages/stains on disc, vibrations or failure on servo. |
| 41 | Electricity | Spindle unlocked. | LOCK = Low continued for 150 msec.<br>→ Damages/stains on disc, vibrations or failure on servo. |
| 42 | Electricity | Sub-code unreadable. | Sub-code was unreadable for 500 msec.<br>→ Damages/stains on disc, vibrations or failure on servo. |
| 43 | Electricity | Sound skipping detected. | Last address memory function was activated.<br>→ Damages/stains on disc, vibrations or failure on servo. |

Note: Mechanical errors during aging are not displayed.

(4) Display of Operational Status during Setup

| Status No. | Contents | Protective action |
|---|---|---|
| 21 | Focus search start | Focus search timeout. |
| 22 | Focus search 2 | Focus search timeout. |
| 23 | Focus search 3 | Focus search timeout. |
| 24 | Focus search 4 | Focus search timeout. |
| 25 | Focus search(Setup protection) | Focus slips off. |
| 26 | Focus search(Fast recovery) | Focus slips off. |
| 27 | RF detection | Focus slips off. |
| 28 | Spindle rough servocontrol | Focus slips off. |
| 29 | Tracking balance adjustment start | Focus slips off. |
| 30 | Tracking balance adjustment 2 | Focus slips off. |
| 31 | Tracking balance adjustment 3 | Focus slips off. |
| 32 | Tracking close start(Spindle stationary servocontrol setting) | Focus slips off. |
| 33 | Tracking close 2 | Focus slips off. |
| 34 | Tracking close 3 | Focus slips off. |
| 35 | Focus/Tracking AGC start | Focus slips off. |
| 36 | Focus/Tracking AGC 2 | Focus slips off. |
| 37 | Focus/Tracking AGC 3 | Focus slips off. |
| 38 | Focus/Tracking AGC 4 | Focus slips off. |
| 39 | Focus/Tracking AGC 5 | Focus slips off. |
| 40 | Focus/Tracking AGC 6 | Focus slips off. |
| 41 | Focus/Tracking AGC 7 | Focus slips off. |
| 42 | Focus/Tracking AGC 8 | Focus slips off. |
| 43 | FE bias start | Focus slips off. |
| 44 | FE bias 2 | Focus slips off. |
| 45 | RF AGC start | Focus slips off. |
| 46 | RF AGC 2 | Focus slips off. |
| 47 | Lock check start | Focus slips off. |
| 48 | Lock is being checked | Focus slips off. |
| 49 | Subcode check start | Focus slips off, spindle lock is not performed. |
| 50 | Subcode is being checked | Focus slips off, no subcode can be read. |

(5) Display Examples

1) During Setup

| 8-digit display, 6-digit display | 4-digit display(Auto setting) | 4-digit display(Manual setting) |
|---|---|---|
| TNO. Min Sec | TNO. | Min Sec |
| 11 11' 11" | 11 | 11' 11" |

2) During Operation (TOC read, TRK search, Play, FF and REV)

The same as in the normal mode.

3) When a Protection Error Occurred

(A) Error display ((A)←→(B), (C) : SCAN key)

| 8-digit display | 6-digit display | 4-digit display |
|---|---|---|
| ERROR-xx | ERR-xx | E-xx |

(B) Error occurrence timing display in track no. ((B)←→(C) : Auto/Manual key)

| 8-digit display, 6-digit display | 4-digit display(Auto setting) |
|---|---|
| TNO. Min Sec | TNO. |
| 10 40' 05" | 10 |

(C) Error occurrence timing display in absolute time. ((B)←→(C) : Auto/Manual key)

| 8-digit display, 6-digit display | 4-digit display(Manual setting) |
|---|---|
| TNO. Min Sec | Min Sec |
| 10 40' 05" | 40' 05" |

# 7. GENERAL INFORMATION

## 7.1 DIAGNOSIS

### 7.1.1 DISASSEMBLY

● **Removing the Case (not shown)**

1. Remove the Case.

---

● **Removing the CD Mechanism Module (Fig.1)**

1 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module.

● **Removing the Grille Assy (Fig.1)**

2 Remove the two screws and then remove the Grille Assy.

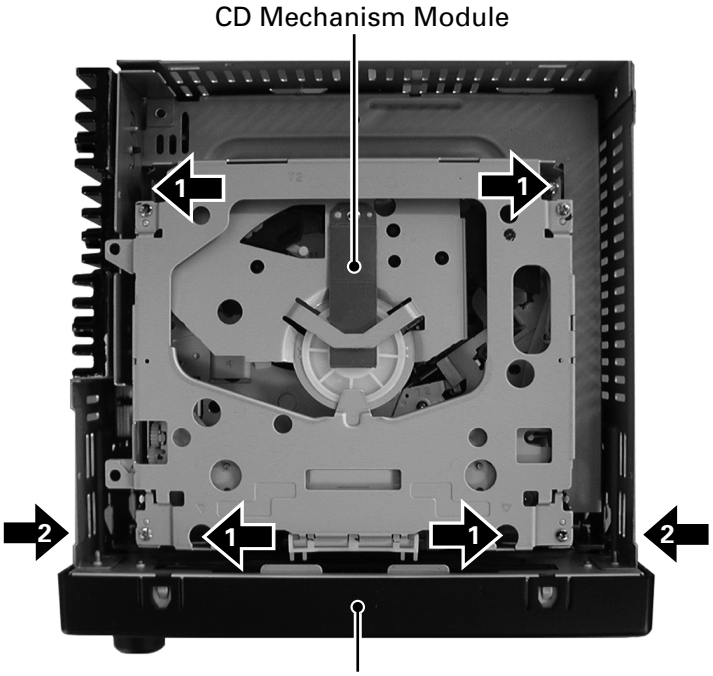



Fig.1

---

● **Removing the Heat Sink (Fig.2)**

1 Remove the two screws.

2 Remove the two screws and then remove the Heat Sink.

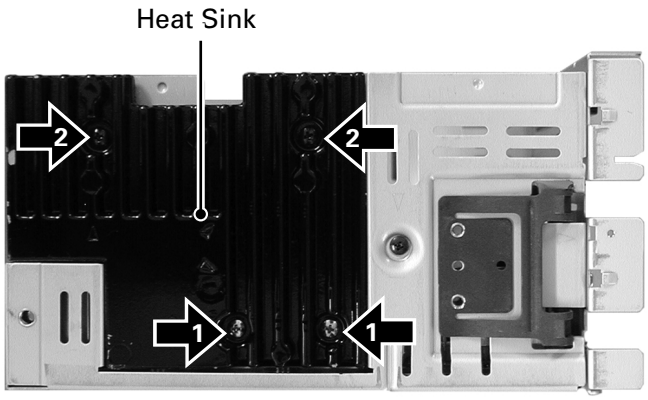



Fig.2

---

● **Removing the Chassis (Fig.3)**

1 Remove the four screws and then remove the Chassis.

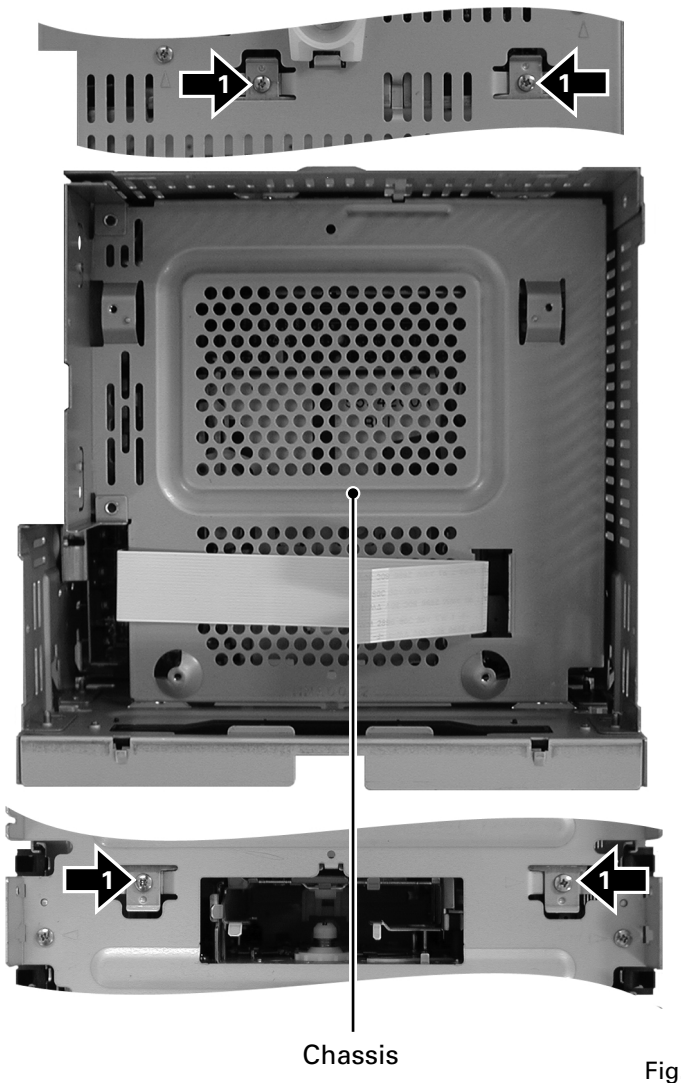



Fig.3

● **Removing the Holder (Fig.4)**

1 Remove the four screws and then remove the Holder.

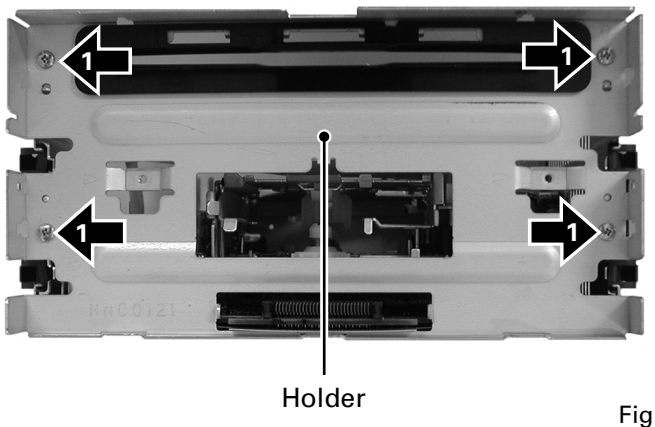



Fig.4

## ● Removing the Cassette Mechanism Module (Fig.5)

1 Remove the four screw and then remove the Cassette Mechanism Module.

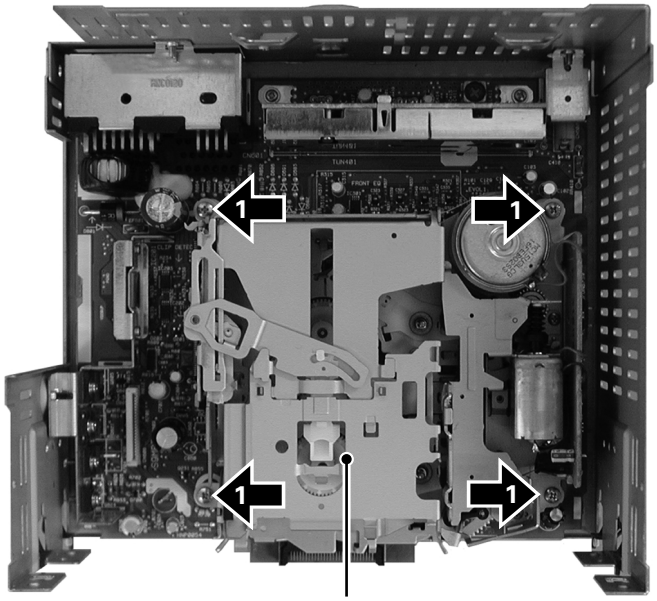



Fig.5

## ● Removing the Mother Unit (Fig.6)

1 Remove the screw.

2 Remove the two screws.

3 Straighten the tabs at two locations indicated.

4 Remove the two screws and then remove the Mother Unit.

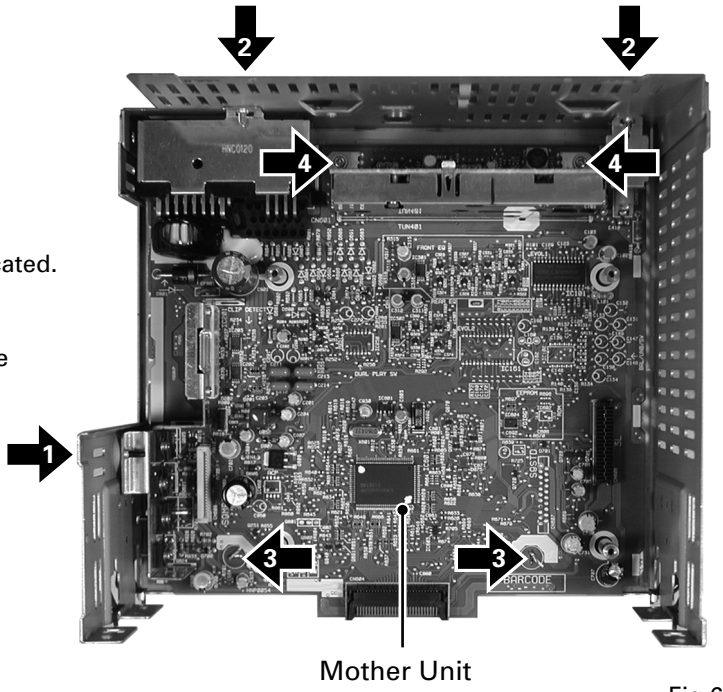
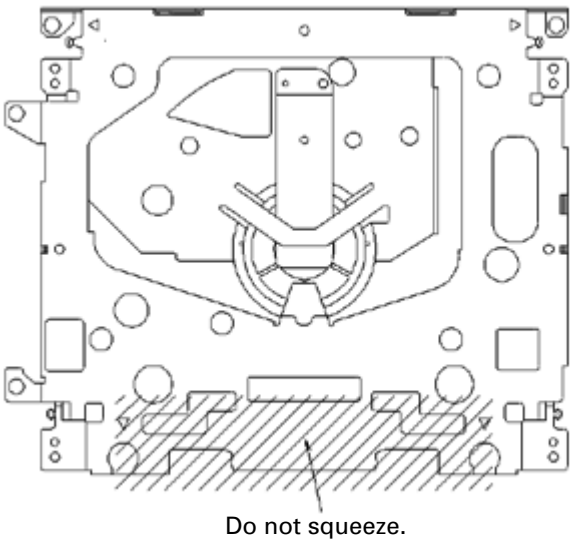



Fig.6

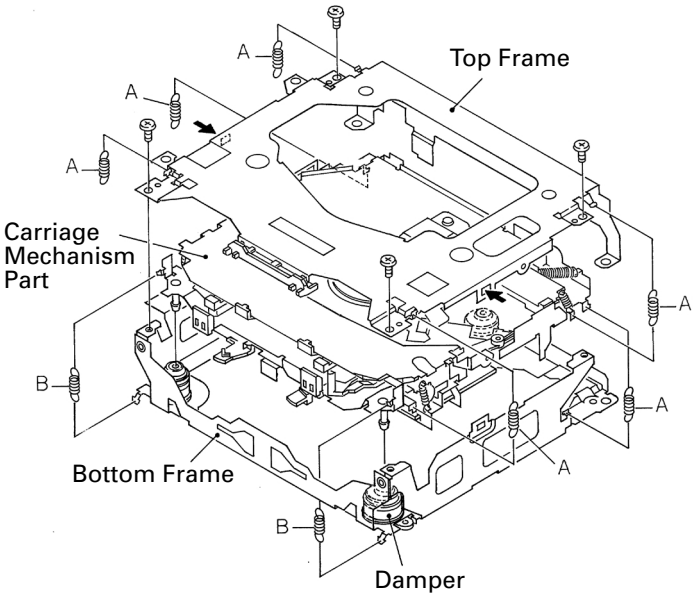
## ● How to hold the Mechanism Unit

1. Hold the top and bottom frame.
2. Do not squeeze top frame's front portion too tight, because it is fragile.



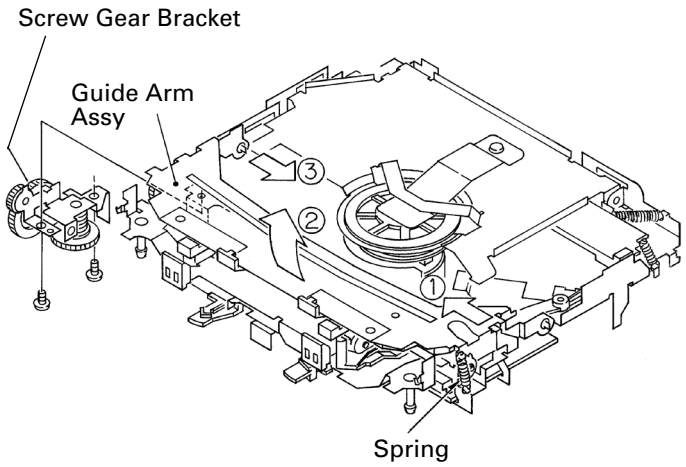

## ● How to remove the Top and Bottom Frame

1. When the disk is in "clamp" state, unlock Spring A (6 pieces) and Spring B (2 pieces), and unscrew screws (4 pieces).
2. Unlock each 1 of pawl at the both side of the frame, then remove the top frame.
3. Remove the Carriage Mechanism part in such way that; you remove the mechanism part from 3 pieces of Damper while slowly pulling up the part.
4. Now, the top frame has been removed, and under this state, fix the genuine Connector again, and eject the disk.
   (Caution)
   When you reassemble the Carriage Mechanism part, apply a bit of alcohol to Dampers.



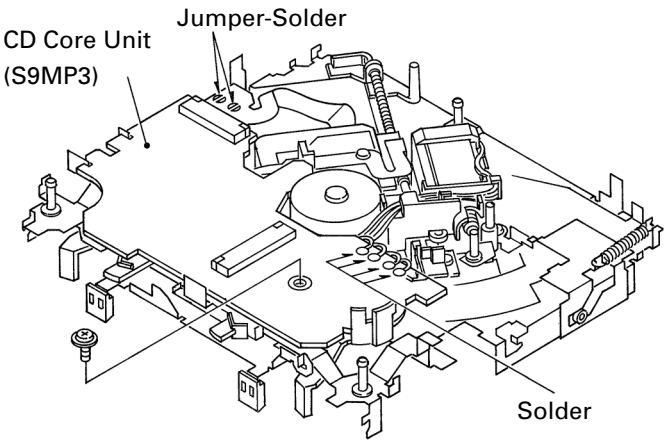

## ● How to remove the Guide Arm Assy

1. Unlock the spring (1 piece) at the right side of the assembly.
2. Unscrew screws (2 pieces), then remove the Screw Gear Bracket.
3. Shift the Guide Arm Assy to the left and slowly rotate it to the upper direction.
4. When the Guide Arm Assy rotates approximately 45 degree, shift the Assy to the right side direction and remove it.



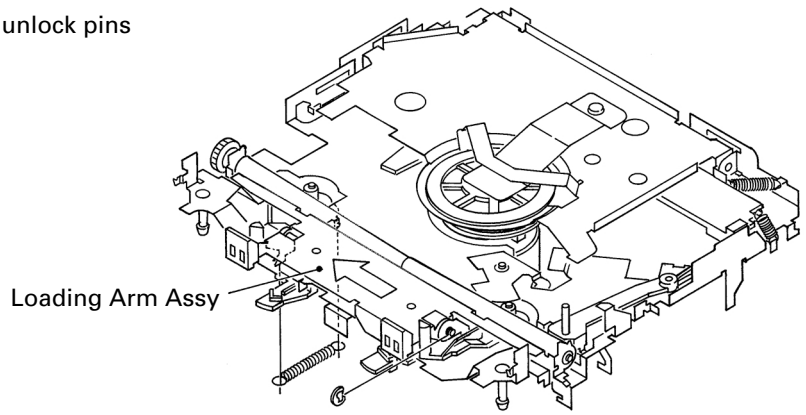
## ● How to remove the CD Core Unit(S9MP3)

1. Give jumper-solder treatment to the Flexible Wire of the Pickup unit, then remove the wire from the Connector.
2. Remove all 4 points of solder-treatment on the Lead Wire. Also, unscrew the screw(1 piece).
3. Then, Remove the CD Core Unit(S9MP3).
   (Caution)
   Be careful not to damage SW when you reassemble the CD Core Unit(S9MP3) into the device.



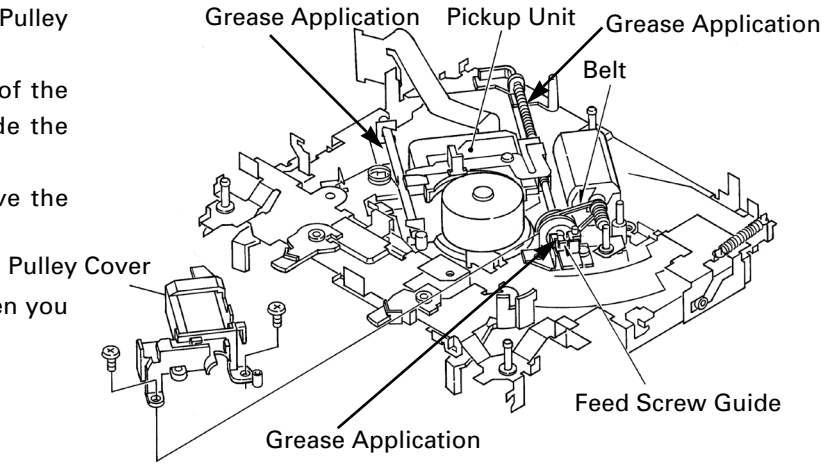

## ● How to remove the Loading Arm Assy

1. Unlock the spring (1 piece) and remove the E ring (1 piece) of the Fulcrum Shaft.
2. Shift the arm to the left side direction and unlock pins (2 pieces).

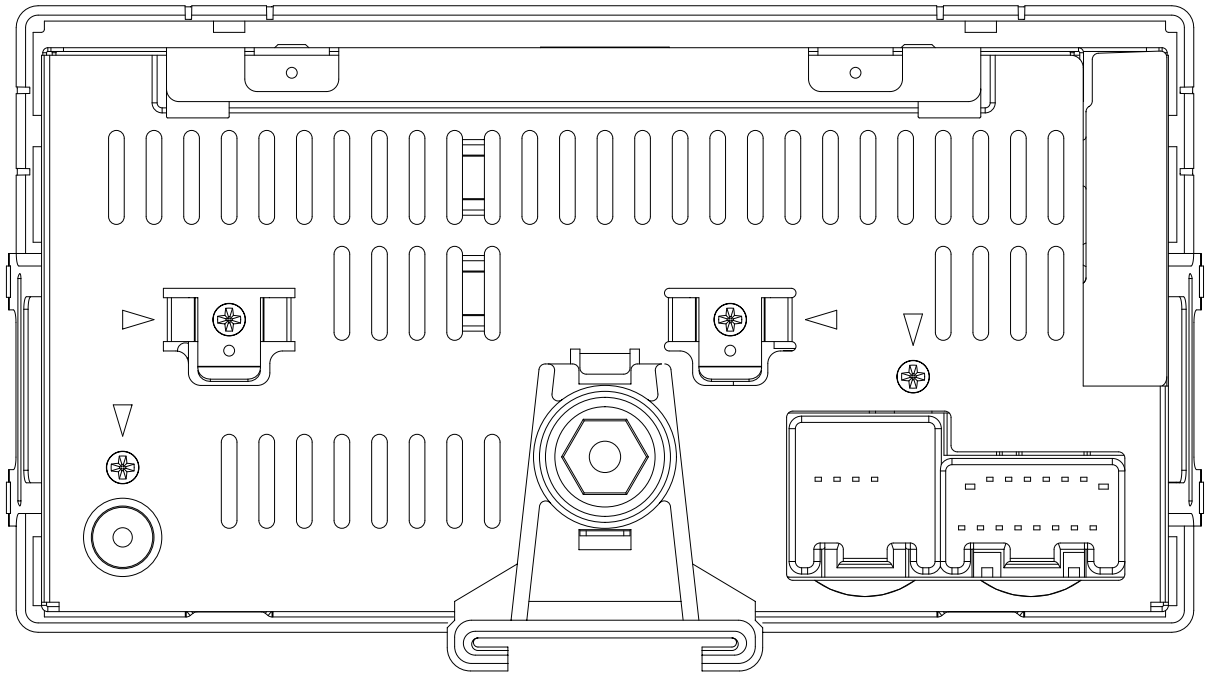


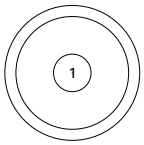

## ● How to remove the Pickup Unit

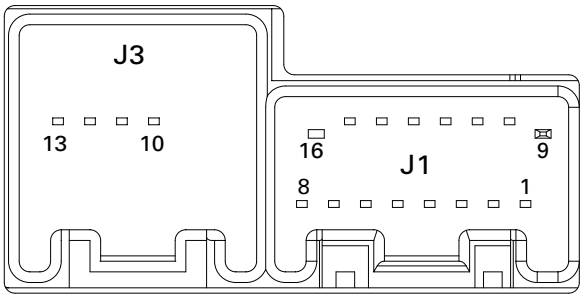
1. Unscrew 2 pieces of screws, then remove the Pulley Cover.
2. Remove the Feed Screw unit from the pawl of the Feed Screw Guide (The pawl is located inside the guide).
3. Remove the belt from the Pulley, then remove the Pickup unit.
   (Caution)
   Make sure not to stain the belt with grease when you fix the belt.



## 7.1.2 CONNECTOR FUNCTION DESCRIPTION






| FM/AM ANTENNA | |
|---|---|
| 1 | ANTENNA IN |
| CASE | RF GND |

| PHONE | |
|---|---|
| 10 | NC(PTA) |
| 11 | NC(PHONE INPUT +) |
| 12 | NC(PHONE INPUT -) |
| 13 | NC(PHONE SHIELD) |

| POWER SUPPLY,SPEAKER | |
|---|---|
| 1 | ILL+ |
| 2 | ILL- |
| 3 | START |
| 4 | CLOCK |
| 5 | RR+ |
| 6 | RR- |
| 7 | FR+ |
| 8 | FR- |
| 9 | B.UP |
| 10 | RUN/ACC |
| 11 | RADIO GND |
| 12 | RL+ |
| 13 | RL- |
| 14 | FL+ |
| 15 | FL- |
| 16 | POWER AMP GND |

# 7.2 PARTS

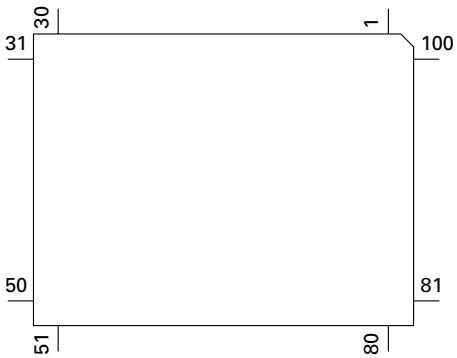
## 7.2.1 IC

● **Pin Functions (PD5755A)**

| Pin No. | Pin Name | I/O | Format | Function and Operation |
|---|---|---|---|---|
| 1 | PDO | O | C | Tuner : PLL data output |
| 2 | $\overline{\text{PCK}}$ | O | C | Tuner : PLL serial clock output |
| 3 | BLPWR | O | | LCD back light power output |
| 4 | ILMOUT | O | | Illumination D/A output |
| 5 | LCDDT | O | C | LCD driver : Data output |
| 6 | PWMIN | I | | Illumination PWM input |
| 7 | LCDCLK | O | C | LCD driver : Clock output |
| 8 | BYTE | | | GND |
| 9 | CNVSS | | | GND |
| 10 | SUBCLKI | I | | Sub clock input |
| 11 | SUBCLKO | O | | Sub clock output |
| 12 | $\overline{\text{RESET}}$ | I | | Reset input |
| 13 | XOUT | O | | Crystal oscillating element connection pin |
| 14 | VSS | | | GND |
| 15 | XIN | I | | Crystal oscillating element connection pin |
| 16 | VCC | | | Power supply terminal |
| 17 | NMI | I | | Not used |
| 18 | SD | I | | Tuner : PLL station detector input |
| 19 | $\overline{\text{ILMINT}}$ | I | | Illumination interrupt input |
| 20 | $\overline{\text{ROTINT}}$ | I | | Rotary encoder interrupt input |
| 21 | $\overline{\text{ASENS}}$ | I | | ACC power sense input |
| 22 | LCDCE | O | C | LCD driver : Chip enable output |
| 23 | $\overline{\text{LCDINH}}$ | O | C | LCD driver : Inhibit output |
| 24 | LEDPWM | | | Not used |
| 25 | SPEED | I | | SPEED pulse input(Not used) |
| 26 | $\overline{\text{ROMCS}}$ | O | C | ROM correction chip select output(Not used) |
| 27 | $\overline{\text{BSENS}}$ | I | | Back up power sense input |
| 28 | $\overline{\text{BSCK}}$ | O | C | P-BUS : Serial clock output |
| 29 | BSI | I | | P-BUS : Serial data input |
| 30 | BSO | O | N | P-BUS : Serial data output |
| 31 | ATXD | O | C | ACP-BUS : ACP data output |
| 32 | ARXD | I | | ACP-BUS : ACP data input |
| 33 | $\overline{\text{EVCE2}}$ | O | C | Electronic volume : Chip enable output 2 |
| 33 | $\overline{\text{EVCE}}$ | O | C | Electronic volume : Chip enable output 1 |
| 35 | EDT | O | C | Electronic volume : Interface Data output |
| 36 | $\overline{\text{CLOCK}}$ | I | | Clock defeat input |
| 37 | ELCK | O | C | Electronic volume : Clock output |
| 38,39 | NC | | | Not used |
| 40 | BRXEN | I/O | /C | P-BUS : Communication enable input / output |
| 41 | $\overline{\text{BSRQ}}$ | I | | P-BUS : Request input |
| 42 | $\overline{\text{BRST}}$ | I | | P-BUS : Reset input(Not used) |
| 43 | RSPSW | O | C | Rear speaker switch output |
| 44 | SWVDD | O | C | LCD driver : Power supply control output |
| 45 | $\overline{\text{EPCE}}$ | O | C | Diagnosis EEPROM : Chip enable output |
| 46 | PLLCE | O | C | Tuner : PLL chip enable output |
| 47 | $\overline{\text{ST}}$ | I | | Tuner : Stereo input |
| 48 | LOCL | O | C | Tuner : Local low output |
| 49 | $\overline{\text{PLLCE2}}$ | O | C | Tuner : PLL chip enable output 2 |
| 50-54 | $\overline{\text{KDT4}}$-$\overline{\text{KDT0}}$ | I | | Key data input 4-0 |
| 55 | RMUTE | O | C | Rear mute output |
| 56 | TESTIN | I | | Test program mode input |
| 57-61 | $\overline{\text{KST5}}$-$\overline{\text{KST1}}$ | O | N | Key strobe output 5-1 |
| 62 | VCC | | | Power supply terminal |
| 63 | $\overline{\text{KST0}}$ | O | N | Key strobe output 0 |
| 64 | VSS | | | GND |
| 65 | $\overline{\text{CLIPIN}}$ | I | | Clip detector input |
| 66 | $\overline{\text{RPAIN}}$ | I | | Reverse perking aid input(Not used) |

| Pin No. | Pin Name | I/O | Format | Function and Operation |
|---|---|---|---|---|
| 67 | $\overline{WC}$ | O | C | Diagnosis EEPROM : Write control output |
| 68 | AUXCNT0 | O | C | Aux input selector 1 output(Not used) |
| 69 | NC | | | Not used |
| 70 | $\overline{SYSPWR}$ | O | C | System power output |
| 71 | FMUTE | O | C | Front mute output |
| 72 | ASYSON | O | C | ACP-BUS : ACP power output |
| 73 | $\overline{WAKEUP}$ | I | | Wake up key sense input(Not used) |
| 74 | $\overline{PTAIN}$ | I | | PTA interrupt input(Not used) |
| 75 | ACPINT | O | | ACP-BUS : ACP interrupter output(Not used) |
| 76 | ROTIN0 | I | | Rotary encoder pulse input 0 |
| 77 | ROTIN1 | I | | Rotary encoder pulse input 1 |
| 78 | CM | O | C | Cassette mechanism : Capstan motor output |
| 79 | STBY | I | | Cassette mechanism : Stand-by output |
| 80 | MS | I | | Cassette mechanism : Music search input |
| 81 | DIR0 | O | C | Cassette mechanism : Forward / reverse change output |
| 82 | PLAY | O | C | Cassette mechanism : MS gain change output |
| 83 | MTL | I | | Cassette mechanism : Metal tape sense input |
| 84 | DMUTE | O | C | Cassette mechanism : Tape mute output |
| 85 | NR | O | C | Cassette mechanism : Dolby NR output |
| 86 | CSLD | I | | Cassette mechanism : Tape loading sense input |
| 87 | POS | I | | Cassette mechanism : Position sense input |
| 88 | ES | I | | Cassette mechanism : End sense input |
| 89 | SC2 | O | C | Cassette mechanism : Sub motor output 2 |
| 90 | SC1 | O | C | Cassette mechanism : Sub motor output 1 |
| 91-93 | NC | | | Not used |
| 94 | SWCIN | I | | SWC input |
| 95 | ILMI | I | | Illumination sense input |
| 96 | AVSS | | | GND |
| 97 | SL | I | | Tuner : SD level input |
| 98 | VREF | | | A/D converter reference voltage terminal |
| 99 | AVDD | | | Power supply terminal |
| 100 | PDI | I | | Tuner : PLL data input |

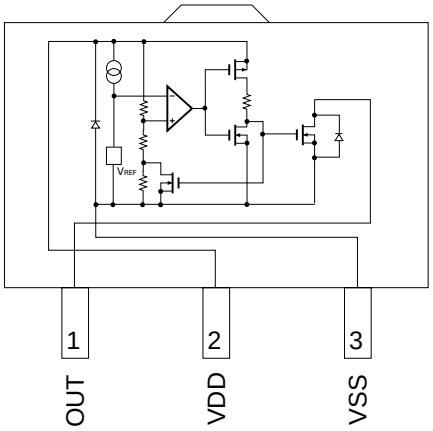
* PD5755A



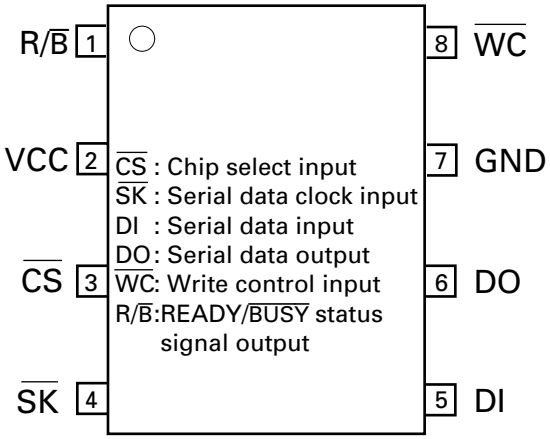

IC's marked by * are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

| Format | Meaning |
|---|---|
| C | C MOS |
| N | N channel open drain |

* S-80842CNDYI



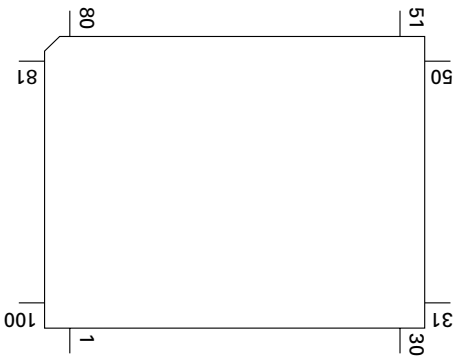

* BR9010FV-W




## ● Pin Functions (LC75813E)

| Pin No. | Pin Name | I/O | Function and Operation |
|---|---|---|---|
| 1 | CL | I | Clock input |
| 2 | DI | I | Data input |
| 3-89 | S1-S87 | O | Segment output |
| 90-92 | COM3-COM1 | O | Common output |
| 93 | VDD | | Logic section power supply terminal |
| 94 | VLCD | | LCD driver section power supply terminal |
| 95 | VLCD1 | | 2/3 VLCD terminal |
| 96 | VLCD2 | | 1/3 VLCD terminal |
| 97 | VSS | | GND |
| 98 | OSC | | Oscillating element connection terminal |
| 99 | $\overline{INH}$ | I | LCD driver inhibit input |
| 100 | CE | I | LCD driver chip enable input |

* LC75813E

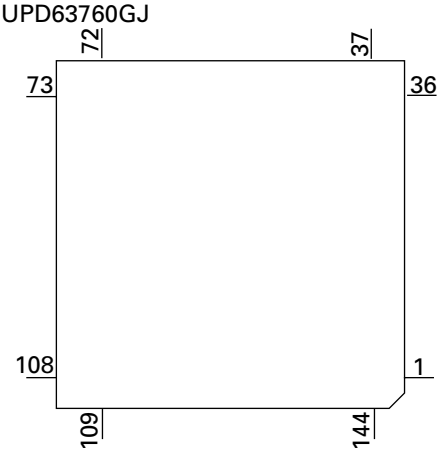


## ● Pin Functions (UPD63760GJ)

| Pin No. | Pin Name | I/O | Function and Operation |
|---|---|---|---|
| 1 | R.GND | | GND for DRAM I/F |
| 2 | $\overline{\text{RST}}$ | I | Input of reset |
| 3-7 | AB12-8 | I | Address bus 12-8 from the microcomputer |
| 8-15 | AD7-0 | I/O | Address/data bus 7-0 to the microcomputer |
| 16 | $\overline{\text{CS}}$ | I | Chip selection |
| 17 | ASTB | I | Address strobe |
| 18 | $\overline{\text{READ}}$ | I | Control signals (read) |
| 19 | $\overline{\text{WRITE}}$ | I | Control signals (write) |
| 20 | $\overline{\text{WAIT}}$ | O | Control signals (wait) |
| 21 | INTQ | | Interruption signals to the external microcomputer |
| 22 | IFMODE | I | Switching between the data buses (16bit/8bit) |
| 23 | D.VDD | | Power supply for digital circuits |
| 24 | $\overline{\text{XTALEN1}}$ | I | Permission to oscillate 16.9344MHz |
| 25 | $\overline{\text{XTALEN2}}$ | I | Permission to oscillate 24.576MHz |
| 26 | DA.VDD | | Power supply for DAC |
| 27 | ROUT | O | Output of audio for the right channel |
| 28 | DA.GND | | GND for DAC |
| 29 | R+ | O | Output of the right channel audio PWM |
| 30 | R- | O | Output of the right channel audio PWM |
| 31 | REGC | | Connected to the capacitor for band gap |
| 32 | L- | O | Output of the left channel audio PWM |
| 33 | L+ | O | Output of the left channel audio PWM |
| 34 | DA.GND | | GND for DAC |
| 35 | LOUT | O | Output of audio for the left channel |
| 36 | DA.VDD | | Power supply for DAC |
| 37 | X.VDD | | Power supply for the crystal oscillator |
| 38 | XTAL1 | | Connected to the crystal oscillator (16.9344MHz) |
| 39 | $\overline{\text{XTAL1}}$ | | Connected to the crystal oscillator (16.9344MHz) |
| 40, 41 | X.GND | | Ground for the crystal oscillator |
| 42 | $\overline{\text{XTAL2}}$ | | Connected to the crystal oscillator (24.576MHz) |
| 43 | XTAL2 | | Connected to the crystal oscillator (24.576MHz) |
| 44 | X.VDD | | Power supply for the crystal oscillator |
| 45 | D.GND | | GND for digital circuits |
| 46 | DIN | I | Input of audio data |
| 47 | DOUT | O | Output of audio data |
| 48 | SCKIN | I | Clock input for audio data |
| 49 | SCKO | O | Clock output for audio data |
| 50 | LRCKIN | I | Input of LRCK for audio data |
| 51 | LRCK | O | Output LRCK for audio data |
| 52 | TESTX | O | Output for tests |
| 53 | RFOK | O | Output of RFOK |
| 54 | C16M | O | Output of 16.9344MHz |
| 55 | TESTEN | I | Connected to GND |
| 56 | TEST4 | I | Connected to GND |
| 57 | D.VDD | | Power supply for digital circuits |
| 58 | RFCK/HOLD | O | Output of RFCK/HOLD signal |
| 59 | WFCK/MIRR | O | Output of WFCK/MIRR signal |
| 60 | PLCK | O | Output of PLCK |
| 61 | LOCK | O | Output of LOCK |
| 62 | C1D1 | O | Information on error correction |
| 63 | C1D2 | O | Information on error correction |
| 64 | C2D1(RMUTE) | O | Information on error correction (mute for Rch) |
| 65 | C2D2(LMUTE) | O | Information on error correction (mute for Lch) |
| 66 | C2D3 | O | Information on error correction |
| 67 | D.GND | | Ground for digital circuits |
| 68 | $\overline{\text{RAS}}$ | O | Output of DRAM RAS |
| 69 | $\overline{\text{CAS0}}$ | O | Output of DRAM Lower CAS |
| 70 | $\overline{\text{CAS1}}$ | O | Output of DRAM Upper CAS |
| 71 | $\overline{\text{WE}}$ | O | Output of DRAM WE |
| 72 | $\overline{\text{OE}}$ | O | Output of DRAM OE |

| Pin No. | Pin Name | I/O | Function and Operation |
|---|---|---|---|
| 73-88 | RDB0-15 | I/O | Input/output of DRAM Data0-15 |
| 89 | D.GND | | Ground for digital circuits |
| 90-99 | RA0-9 | O | Output of DRAM Address0-9 |
| 100 | D.VDD | | Power supply for digital circuits |
| 101-104 | TEST0-3 | I | Connected to GND |
| 105 | FD | O | Output of focus drive PWM |
| 106 | TD | O | Output of tracking drive PWM |
| 107 | SD | O | Output of thread drive PWM |
| 108 | MD | O | Output of spindle drive PWM |
| 109 | A.VDD | | Power supply for the analog system |
| 110 | ATEST | O | Analog tests |
| 111 | EFM | O | Output of EFM signals |
| 112 | ASY | I | Input of asymmetry |
| 113 | C3T | | Connection to the capacitor for detecting 3T |
| 114 | A.GND | | Ground for the analog system |
| 115 | RFI | I | Input of RF |
| 116 | AGCO | O | Output of RF |
| 117 | AGCI | I | Input of AGC |
| 118 | RFO | O | Output of RF(AGC) |
| 119, 120 | EQ2, 1 | | Equalizer 2, 1 |
| 121 | RF2- | I | Reversal input of RF2 |
| 122 | RF- | I | Reversal input of RF |
| 123 | A.GND | | Ground for the analog system |
| 124 | A | I | Input of A |
| 125 | C | I | Input of C |
| 126 | B | I | Input of B |
| 127 | D | I | Input of D |
| 128 | F | I | Input of F |
| 129 | E | I | Input of E |
| 130 | A.VDD | | Power supply for the analog system |
| 131 | REFOUT | O | Output of reference voltage |
| 132 | REFC | | Connected to the capacitor for output of REFOUT |
| 133 | FE- | I | Reversal input of FE |
| 134 | FEO | O | Output of FE |
| 135 | TE- | I | Reversal input of TE |
| 136 | TEO | O | Output of TE |
| 137 | TE2 | O | TE2 |
| 138 | TEC | I | TEC |
| 139 | A.GND | | Ground for the analog system |
| 140 | LDREGO | O | Output of REG voltage for APC |
| 141 | PD | I | Input of PD |
| 142 | LD | O | Output of LD |
| 143 | PN | I | Assignment of pickup polarity |
| 144 | A.VDD | | Power supply for the analog system |

* UPD63760GJ

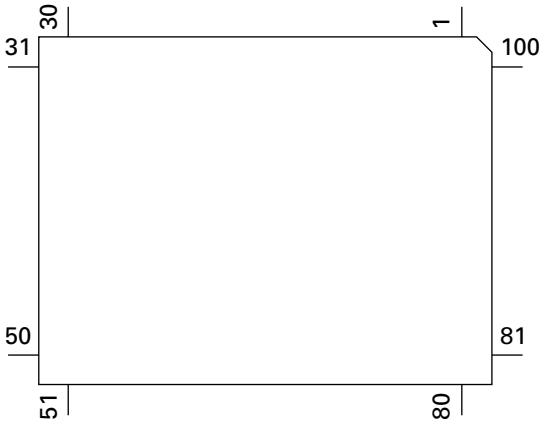


## ● Pin Functions(PE5317B)

| Pin No. | Pin Name | I/O | Format | Function and Operation |
|---|---|---|---|---|
| 1 | FTXD | O | C | For rewriting Flash EP-ROM (sending signals) |
| 2 | NC | | | Open |
| 3 | BSI | I | | Input of P-Bus serial data |
| 4 | BSO | O | C | Output of P-Bus serial data |
| 5 | $\overline{\text{BSCK}}$ | I/O | /C | Input/output of P-Bus serial clock |
| 6, 7 | DFS1, 2 | O | C | Output 1, 2 of settings of DA I/F IC sampling frequency |
| 8 | DCKS | O | C | Output for selection of DA I/F IC clock subharmonic number |
| 9 | EVDD | | | Positive power supply for E power |
| 10 | EVSS | | | Potential of GND of E power |
| 11 | NC | | | Open |
| 12 | DCOPY | O | C | Output of settings of DA I/F IC copy flag |
| 13 | $\overline{\text{CRST}}$ | O | C | Output of reset control of Compression IC |
| 14-16 | CBANK0-2 | O | C | Output 0-2 of bank settings of Compression IC |
| 17 | $\overline{\text{EMPH}}$ | O | C | Output of information on emphasis |
| 18 | DSPMUTE | O | C | Output of DOUT Mute |
| 19 | DSET | O | C | Output for lighting the disc set indicator |
| 20 | $\overline{\text{ADENA}}$ | O | C | Output of control of A/D reference voltage supply |
| 21 | IC/VPP | | | IC: connected directly to VSS / VPP: Pull-down |
| 22 | BRXEN | I/O | /C | P-Bus receiving enabled |
| 23 | $\overline{\text{BSRQ}}$ | I/O | /C | Request for P-Bus service request |
| 24 | $\overline{\text{XTALEN1}}$ | O | C | Output of permission to oscillate CD LSI 16.9344MHz |
| 25 | $\overline{\text{XTALEN2}}$ | O | C | Output of permission to oscillate CD LSI 24.576MHz |
| 26 | $\overline{\text{XRST}}$ | O | C | Output of control of CD LSI reset |
| 27 | VDCONT | O | C | Output of control of VD power supply |
| 28 | CD3VON | O | C | Output of control of CD +3.3V power supply |
| 29 | CONT | O | C | Output of control of power supply to servo driver |
| 30 | $\overline{\text{XWAIT}}$ | I | | Input of control signals of CD LSI wait |
| 31 | LOEJ | O | C | Output for switching between LOAD/EJECT directions |
| 32 | CLCONT | O | C | Output for switching between driver inputs |
| 33 | CDMUTE | O | C | Output of control of CD Mute |
| 34 | $\overline{\text{RESET}}$ | I | | Input of system reset |
| 35 | XT1 | I | | Connected to the oscillator for subclock (connected to VSS via the resistor) |
| 36 | XT2 | | | Connected to the oscillator for subclock (Open) |
| 37 | REGC | | | Connected to the capacity stabilizing output of the regulator (an electrolytic capacitor of about 1µF) |
| 38 | X2 | | | Connected to the oscillator for the main clock |
| 39 | X1 | I | | Connected to the oscillator for the main clock |
| 40 | VSS | | | Potential of GND |
| 41 | VDD | | | Positive power supply (5V) |
| 42 | CLKOUT | O | C | Output of internal system clock (Open) |
| 43 | $\overline{\text{XWRITE}}$ | O | | Output of control signals of CD LSI light |
| 44 | $\overline{\text{UBEN}}$ | O | | Not used (Open) |
| 45 | WR/W | O | | Output of Read/Write control signals of WMA decoder |
| 46 | $\overline{\text{XREAD}}$ | O | | Output of read control signals of CD LSI |
| 47 | XASTB | O | | Output of CD LSI address strobe |
| 48 | LOCK | I | | Input of spindle lock |
| 49 | $\overline{\text{WRST}}$ | O | C | Output for reset control of WMA decoder |
| 50-57 | AD0-7 | I/O | /C | Address/Data Bus 0-7 |
| 58 | BVDD | | | B power supply, positive supply (3.3V) |
| 59 | BVSS | | | B power supply, potential of GND |
| 60-67 | AD8-15 | I/O | /C | Address/Data Bus 8-15 |
| 68 | $\overline{\text{XCS}}$ | O | C | Output for chip selection of CD LSI |
| 69 | $\overline{\text{WCS}}$ | O | C | Output for chip selection of WMA decoder |
| 70, 71 | DBBWRDY0, 1 | I | | Input of write-ready flag with WMA decoder DBBI0, 1 |
| 72, 73 | DBBRRDY0, 1 | I | | Input of read-ready flag with WMA decoder DBBO0, 1 |
| 74 | AVDD | | | A power supply, positive supply (5V) |
| 75 | AVSS | | | A power supply, potential of GND |

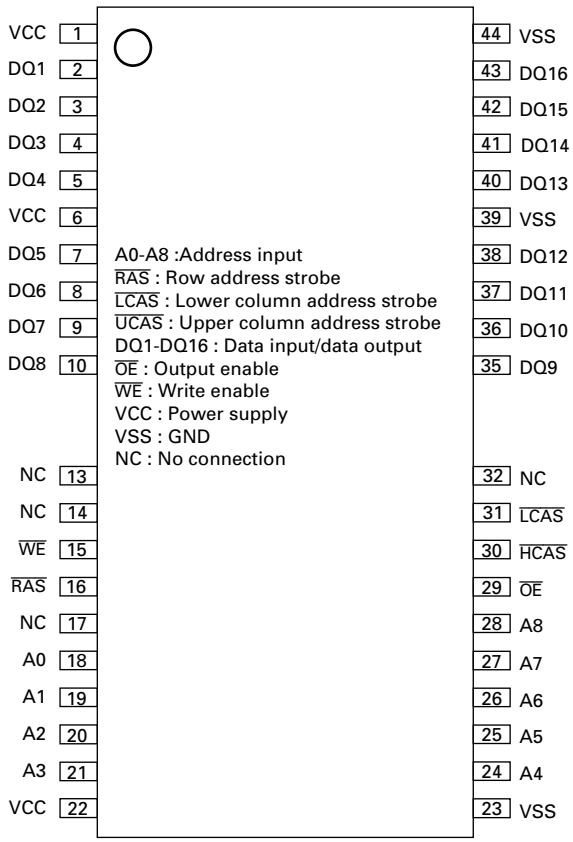
| Pin No. | Pin Name | I/O | Format | Function and Operation |
|---|---|---|---|---|
| 76 | AVREF | | | Input of reference voltage for A/D converter |
| 77 | VDSENS | | | Input of sensing short of VD power supply |
| 78 | DSCSNS | | | Input of sensing disc status |
| 79 | TEMP | | | Input of sensing information on temperature |
| 80 | HOME | I | | Input of sensing Home SW |
| 81 | $\overline{\text{CSENS}}$ | I | | Input of sensing the flap closed |
| 82 | FOK | | | Connected to AVDD or AVSS via the resistor |
| 83-85 | NC | | | Connected to AVDD or AVSS via the resistor |
| 86 | WMAARI | I | | Input of sensing existence of WMA decoder & DA I/F IC |
| 87 | DSPARI | I | | Input of sensing existence of external DRAM for CD LSI |
| 88 | $\overline{\text{TESTIN}}$ | I | | Input with starting test program for checking chips |
| 89 | PULLDOWN | | | Connected to EVDD or EVSS via the resistor |
| 90 | $\overline{\text{XINT}}$ | | | Input of interruption signals of CD LSI |
| 91 | $\overline{\text{WINT}}$ | | | Input of interruption signals of WMA decoder |
| 92 | $\overline{\text{BRST}}$ | I | | Input of reset of P-Bus |
| 93 | $\overline{\text{EJSW}}$ | I | | Input of Eject key |
| 94-96 | NC | | | Open |
| 97 | SI0 | I/O | /C | Input/output of E2PROM data |
| 98 | SO0 | O | C | Output for chip selection of E2PROM |
| 99 | SCK0 | O | C | Output of clock of E2PROM |
| 100 | FRXD | I | | For rewriting Flash EP-ROM (receiving signals) |

* PE5317B

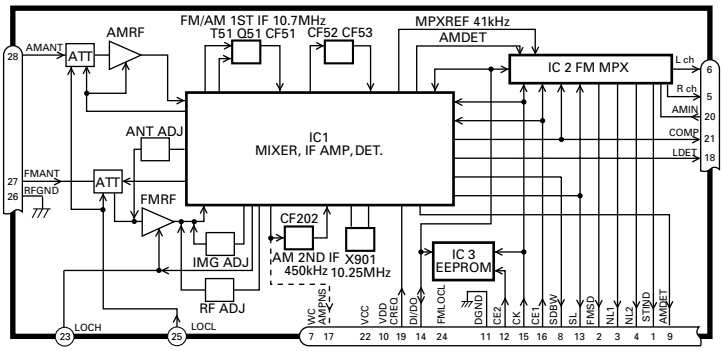



| Format | Meaning |
|---|---|
| C | C MOS |

* MSM51V4265EP-70TS



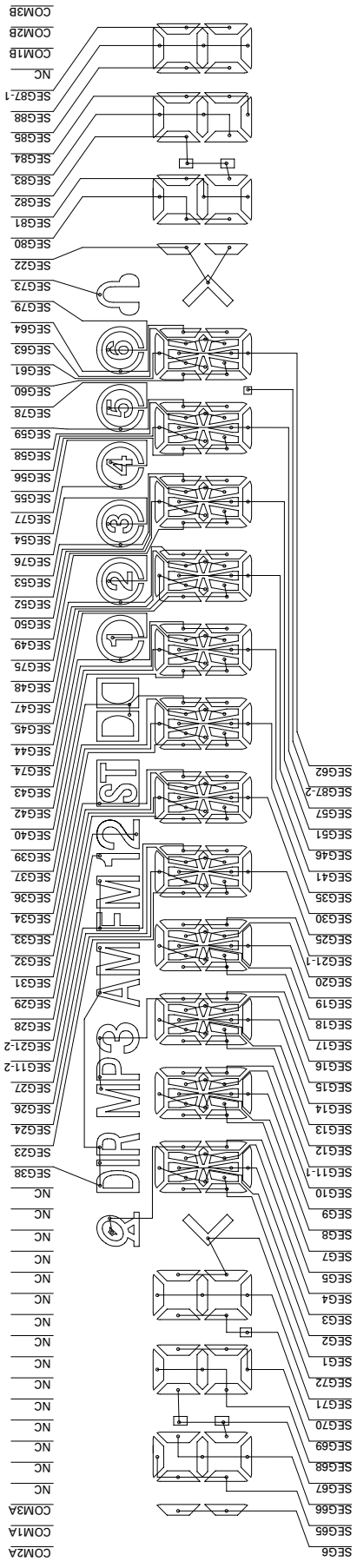
## ● FM/AM Tuner Unit

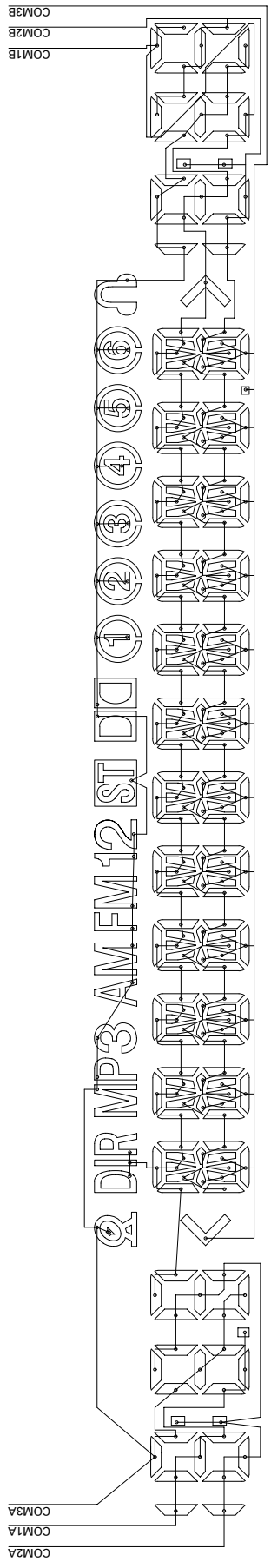



| No. | Symbol | I/O | Explain | |
|---|---|---|---|---|
| 1 | STIND | O | stereo indicator | "Low" when the FM stereo signals are received.<br>To be pulled up to the "VDD" at 47kΩ. |
| 2 | FMSD | O | FM station detector | "High" when signals are received. To be pulled up to the "VDD" at 47kΩ<br>Meanwhile, 10kΩ should be used when taking diver FIX trigger from here and "High: 0.9VDD or more" and "Low: 250mV or less".<br>(Should satisfy the diver IC specifications) |
| 3 | NL1 | O | noise level-1 | "High" when noise is received. Output for the RDS. GND at 47kΩ//1,800pF. |
| 4 | NL2 | O | noise level-2 | "High" when noise is received. Output for the RDS. GND at 36kΩ//330pF. |
| 5 | Rch | O | R channel output | FM stereo "R-ch" signal output or AM audio output.<br>Add the specified de-emphasis constant. |
| 6 | Lch | O | L channel output | FM stereo "L-ch" signal output or AM audio output.<br>Add the specified de-emphasis constant. |
| 7 | WC | | write control | EEPROM write control. Writing permissible at "Low". Normally open. |
| 8 | SDBW | O | SD bandwidth | SD bandwidth signal output. For detection of detuning data for the RDS. |
| 9 | AMDET | O | AM detector output | AM detector output. r out < 100Ω |
| 10 | VDD | | power supply | Power supply pin for the digital section.<br>DC 5V +/- 0.25V. Be careful about overlapping noise in the logic section. |
| 11 | DGND | | digital ground | Grounding for the digital section. |
| 12 | CE2 | I | chip enable-2 | EEPROM chip enable. Active a "Low"<br>To be pulled up to the "VDD" at 47kΩ |
| 13 | SL | I/O | signal level | Received FM/AM signal level (strength) output.<br>Connect the specified load resistor and capacitor (10k Ω+ 39k Ω//4,700pF) |
| 14 | DI/DO | I/O | data input/ data output | Data input/Data output<br>To be pulled up to the "VDD" at 47kΩ |
| 15 | CK | I | clock | Clock input To be pulled up to the "VDD" at 47kΩ |
| 16 | CE1 | I | chip enable-1 | AF·RF chip enable. Active at "High"To be grounded at 47kΩ |
| 17 | AMPNS | O | AM PNS IF signal | IF signal output for AM PNS circuit. |
| 18 | LDET | O | lock detector | Active at "Low". To be pulled up to the "VDD" at 47kΩ |
| 19 | CREQ | I | current request | Active at "Low". To be grounded at 47kΩ |
| 20 | AMINI | | AM audio input | The frequency response and the level are set by connecting an external CR network with terminal AMIN as terminal AMDET. r in = 50kΩ |
| 21 | COMP | O | composite signal | FM composite signal output. r out < 100Ω |
| 22 | VCC | | power supply | Analog section power supply pin.DC 8.4V +/- 0.3V |
| 23 | LOCH | I | local high | FM local high pin. When seeking local high, apply 5V together with "LOCL". |
| 24 | FMLOCL | I | FM local low | FM local low pin. When seeking local low, apply 5V to the base of the NPN transistor with which the specified resistor is being connected to the emitter. Keep it open in case of ordinary marketed models. |
| 25 | LOCL | I | local low | FM/AM local low pin. When seeking local low, apply 5V to the base of the NPN transistor.Since this pin is exclusive for AM when the FMLOCL is in use, do not drive it under FM. |
| 26 | RFGND | | RF ground | Grounding for the antenna section. |
| 27 | FMANT | I | FM antenna input | FM antenna input. 75Ω. Surge absorber (DSP-201M-S00B) is necessary. |
| 28 | AMANT | I | AM antenna input | AM antenna input. High impedance.<br>Connect to the antenna through an L (LAU type) of 4.7μH.To cope with the power transmission line hums, insert a series circuit consisting of an L (a coil of about 100mH) + R (a resistor of 470 Ω to 2.2kΩ) between the GND. |

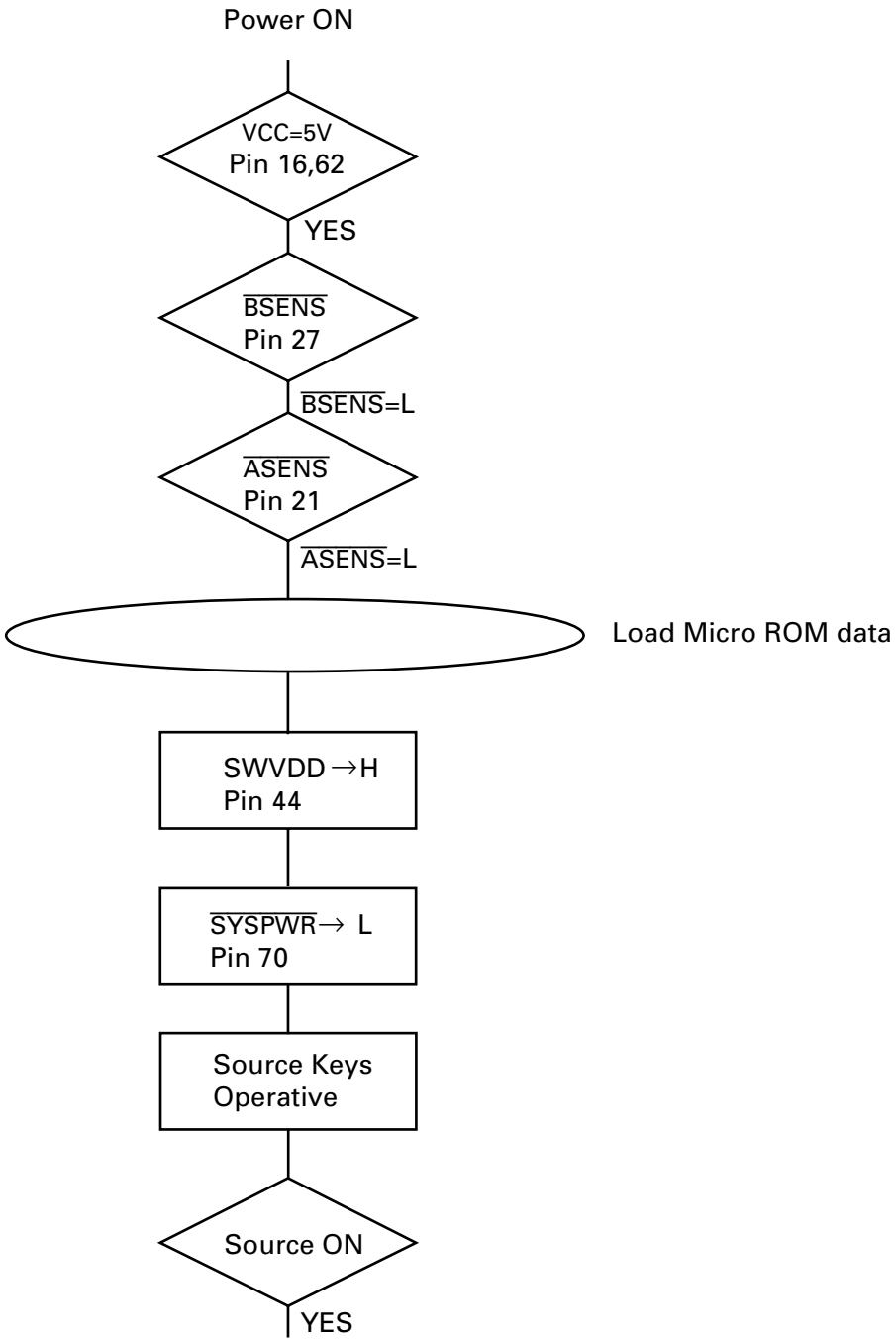
## 7.2.2 DISPLAY

### ● LCD(CAW1822)



## 7.3 OPERATIONAL FLOW CHART




Completes power-on operation.
(After that, proceed to each source operation)

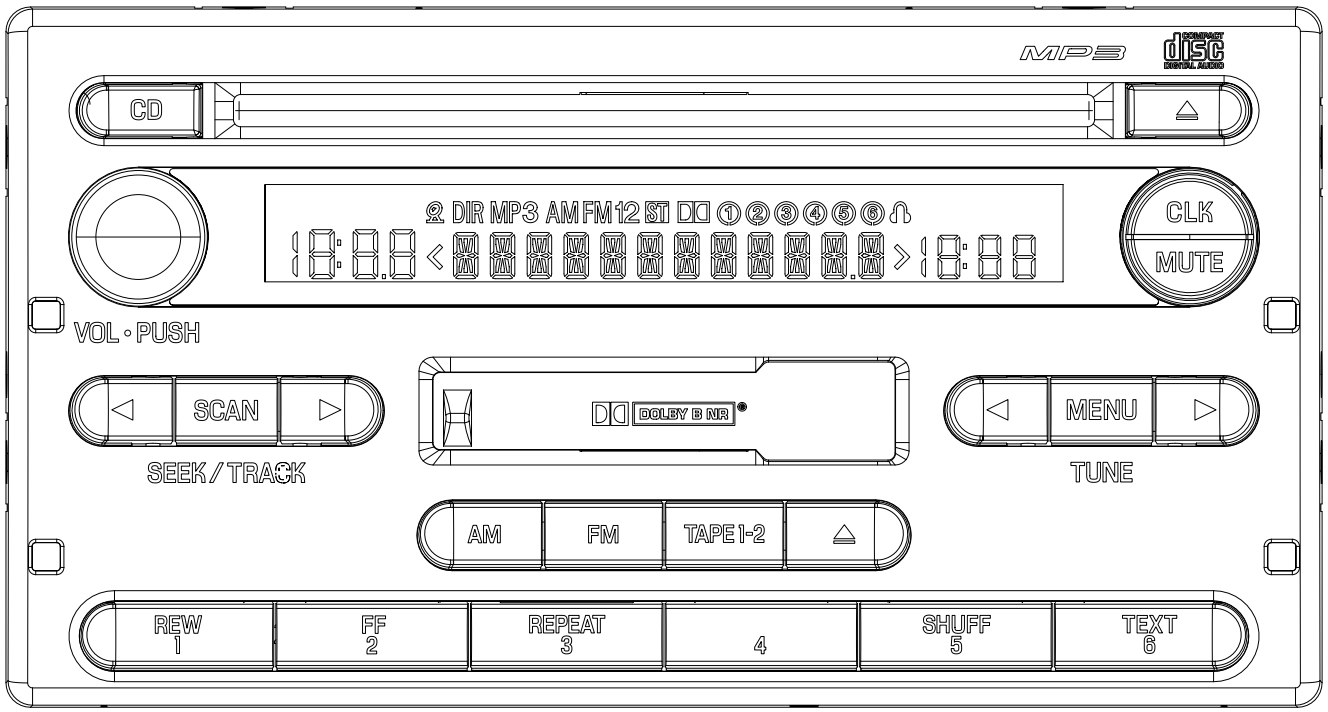
## 7.4 CLEANING

Before shipping out the product, be sure to clean the following portions by using the prescribed cleaning tools:

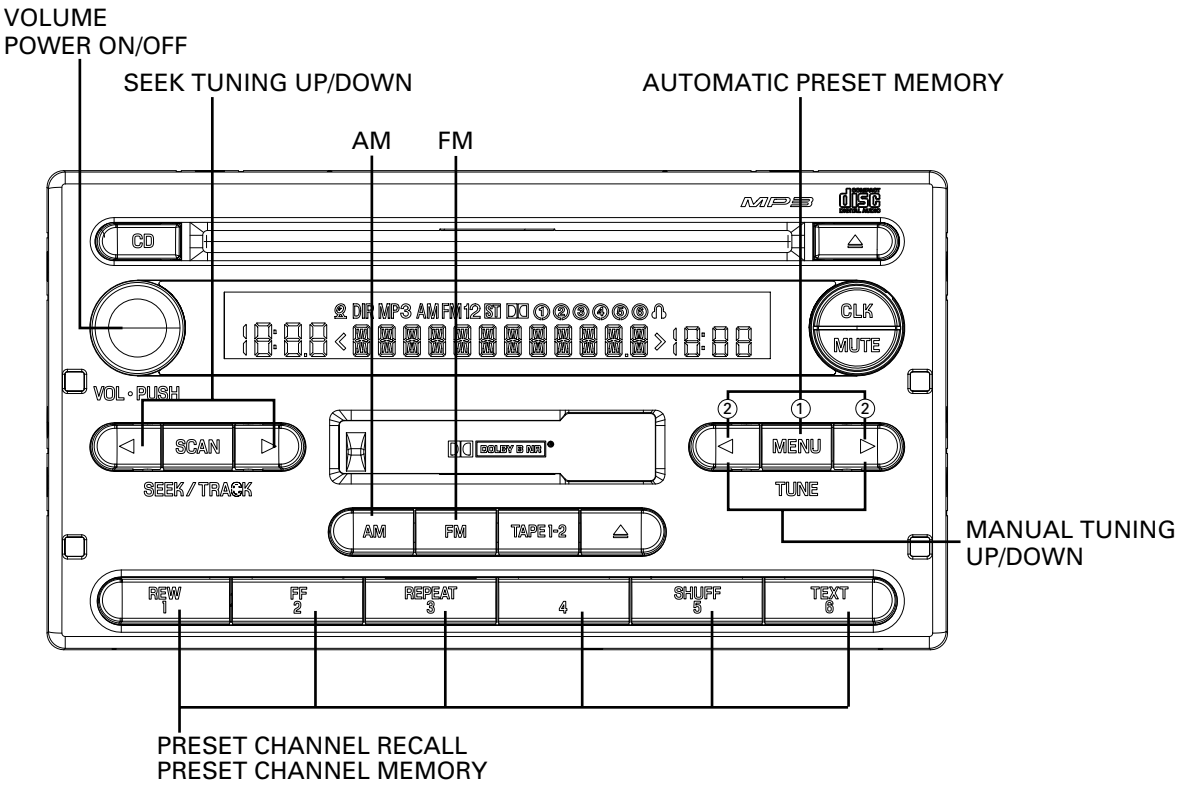
| Portions to be cleaned | Cleaning tools |
|---|---|
| CD pickup lenses | Cleaning liquid : GEM1004<br>Cleaning paper : GED-008 |

| Portions to be cleaned | Cleaning tools |
|---|---|
| Cassette heads<br>Pinch rollers<br>Capstans | Cleaning paper : GED-008 |

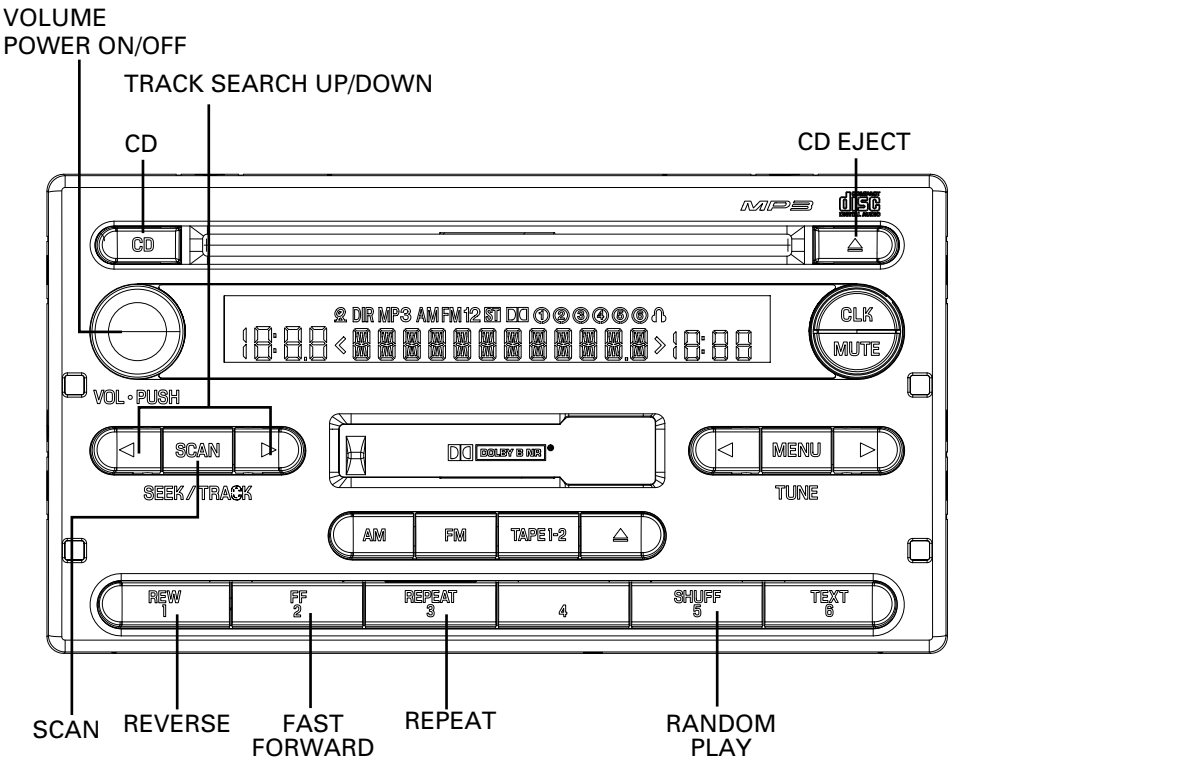
# 8. OPERATIONS



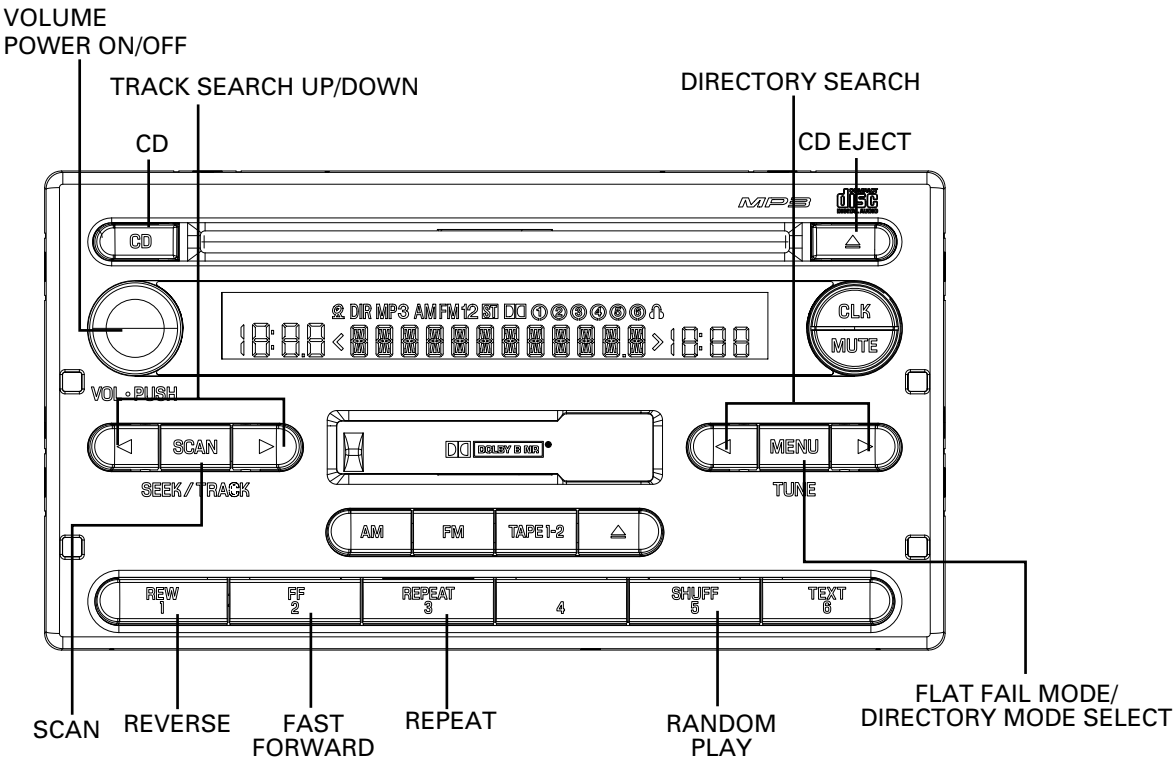
## ● RADIO


VOLUME
POWER ON/OFF
SEEK TUNING UP/DOWN
AUTOMATIC PRESET MEMORY
AM
FM
CD
CLK
MUTE
VOL・PUSH
SCAN
SEEK / TRACK
MENU
TUNE
MANUAL TUNING
UP/DOWN
AM
FM
TAPE1-2
REW
FF
REPEAT
SHUFF
TEXT
PRESET CHANNEL RECALL
PRESET CHANNEL MEMORY

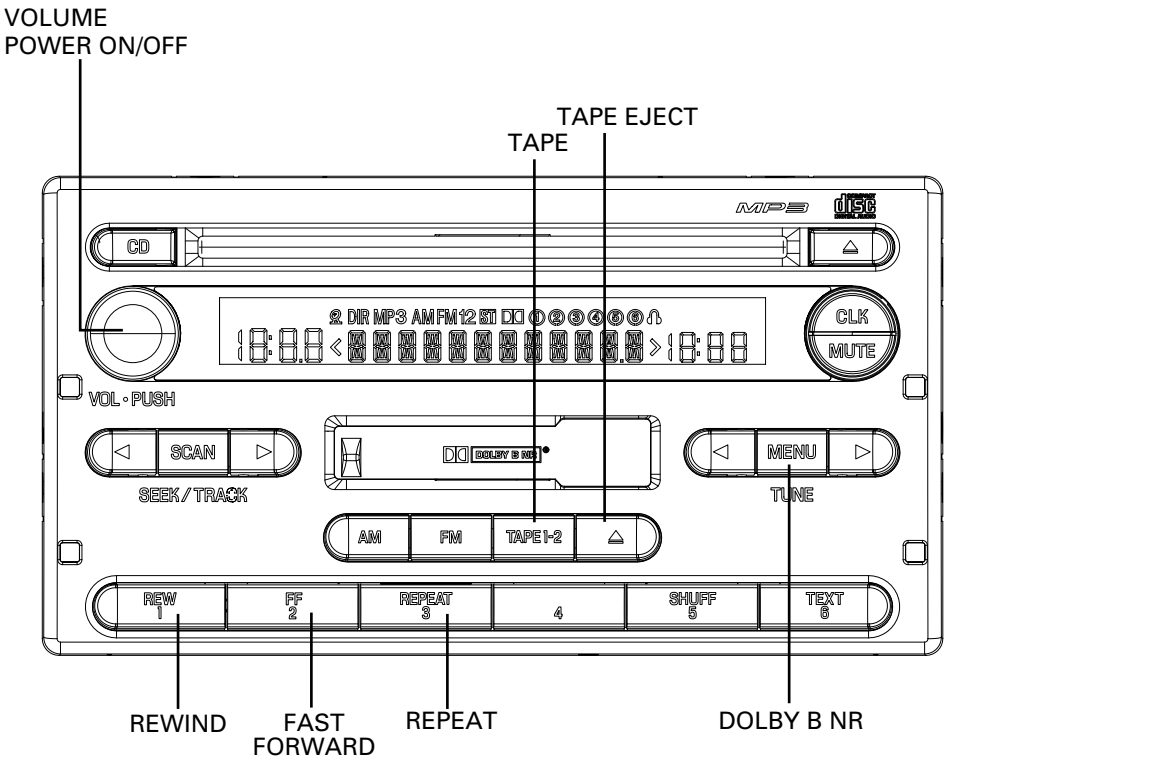
## ● CD


VOLUME
POWER ON/OFF
TRACK SEARCH UP/DOWN
CD
CD EJECT
CLK
MUTE
VOL・PUSH
SCAN
SEEK / TRACK
MENU
TUNE
AM
FM
TAPE1-2
REW
FF
REPEAT
SHUFF
TEXT
SCAN
REVERSE
FAST
FORWARD
REPEAT
RANDOM
PLAY

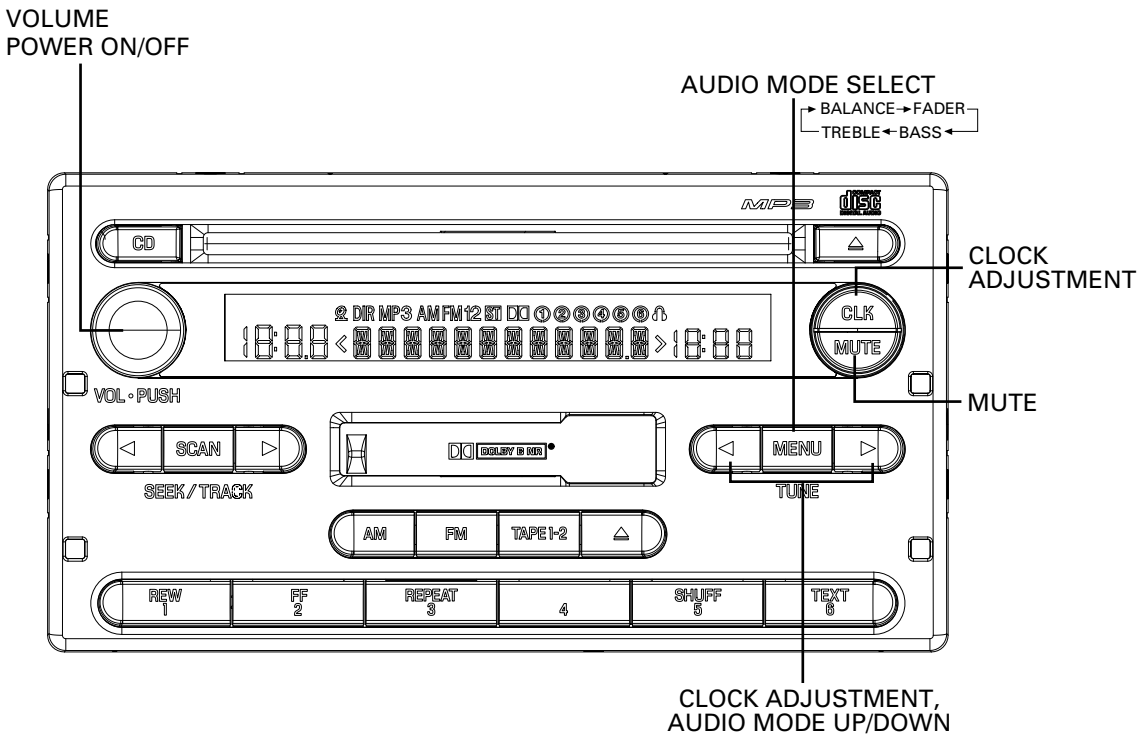
## ● MP3


VOLUME
POWER ON/OFF
TRACK SEARCH UP/DOWN
DIRECTORY SEARCH
CD
CD EJECT
CD
CLK
MUTE
VOL • PUSH
SCAN
SEEK / TRACK
MENU
TUNE
AM
FM
TAPE 1-2
REW 1
FF 2
REPEAT 3
4
SHUFF 5
TEXT 6
SCAN
REVERSE
FAST FORWARD
REPEAT
RANDOM PLAY
FLAT FAIL MODE/
DIRECTORY MODE SELECT

## ● TAPE


VOLUME
POWER ON/OFF
TAPE EJECT
TAPE
CD
CLK
MUTE
VOL • PUSH
SCAN
SEEK / TRACK
MENU
TUNE
AM
FM
TAPE 1-2
REW 1
FF 2
REPEAT 3
4
SHUFF 5
TEXT 6
REWIND
FAST FORWARD
REPEAT
DOLBY B NR

## ● AUDIO


VOLUME
POWER ON/OFF
AUDIO MODE SELECT
BALANCE → FADER
TREBLE ← BASS
CLOCK
ADJUSTMENT
MUTE
CD
CLK
MUTE
VOL • PUSH
SCAN
SEEK / TRACK
MENU
TUNE
AM
FM
TAPE 1-2
REW 1
FF 2
REPEAT 3
4
SHUFF 5
TEXT 6
CLOCK ADJUSTMENT,
AUDIO MODE UP/DOWN